THE AUTOMOBILE.

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LONG ISLAND AGAIN PROVIDES CUP COURSE

Nassau County Supervisors Grant Permission for American Elimination and Cup Races—Thirty-mile Circuit Changed Somewhat

TIME brings many alterations in public sentiment as the automobile makes its insistent progress, and this was amply illustrated on Monday, August 20, at Mineola, the county seat of Nassau County, N. Y., when the Board of Supervisors, backed by a petition of over 1,500 residents, granted the application of the American Automobile Association to hold in the confines of the county the third contest for the William K. Vanderbilt, Jr., Cup. Supervisors Jones and Willetts were favorable, while Supervisor Seabury repeated his objection of a year ago. While many residents of Nassau County admit that to some degree the presence of the high-speed racing cars puts them to inconvenience previous to and during the races, the consensus of opinion is that the benefits accruing, in the way of advertising Long Island and attracting a most substantial class, outweigh any

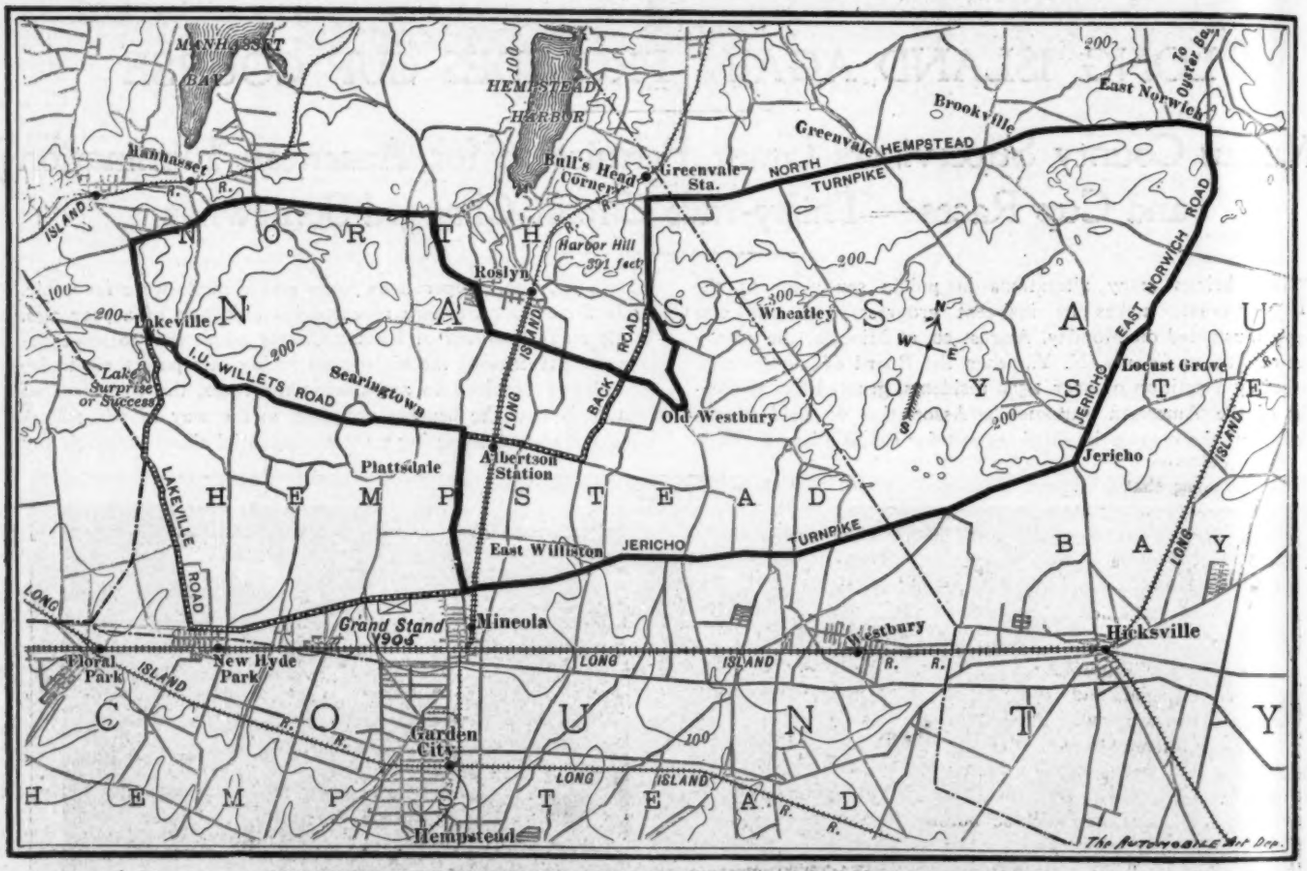
POSSIBLY MOST DIFFICULT TURN OF REVISED COURSE—WHERE MINEOLA AVENUE JOINS NORTH HEMPSTEAD TURNPIKE.

temporary disturbance resulting from the harboring of the automobile army, which incidentally leaves a generous supply of dollars in its trail.

September 22 is the date of the American Elimination Trial, the distance for which will be exactly the same as that for the Cup Race itself on October 6. Of course, the Supervisors require that all expenses in connection with the racing are to be borne by the American Automobile Association, which will oil the course, supply flagmen, and generally safeguard the public and the contestants as far as lies in its power. Once upon a time Nassau County was a hotbed of motorphobia, and while a few are still antagonistic, owing to the reprehensible acts of the offending few, the county, as a whole, desires to have within its boundaries the most spectacular event of the age.

Cup Donor Vanderbilt industriously examined the highways and byways of Nassau County for many weeks, and as the result of his investigations he suggested to Chairman Jefferson de Mont Thompson various changes in the course, necessitated by the construction of a trolley line that traversed the Jericho Turnpike on the section of the old course extending from New Hyde Park to Mineola. Chairman Thompson took a trip over the new course, coincided with Mr. Vanderbilt, and made the application to the Board of Supervisors to meet the new conditions. While there are several turns added as a result of the revision, the course generally excels that of a year ago, and answers for the varied conditions that should be exacted in a road contest. The famous "S" curve at Albertson's, where Foxhall Keene came to grief, has been obliterated, and the railroad crossing likewise disappears from the map. This time the second crossing of the Long Island Railroad is near Roslyn and underneath, the remaining grade crossing being on the Jericho Turnpike, just below Krug's Corner.

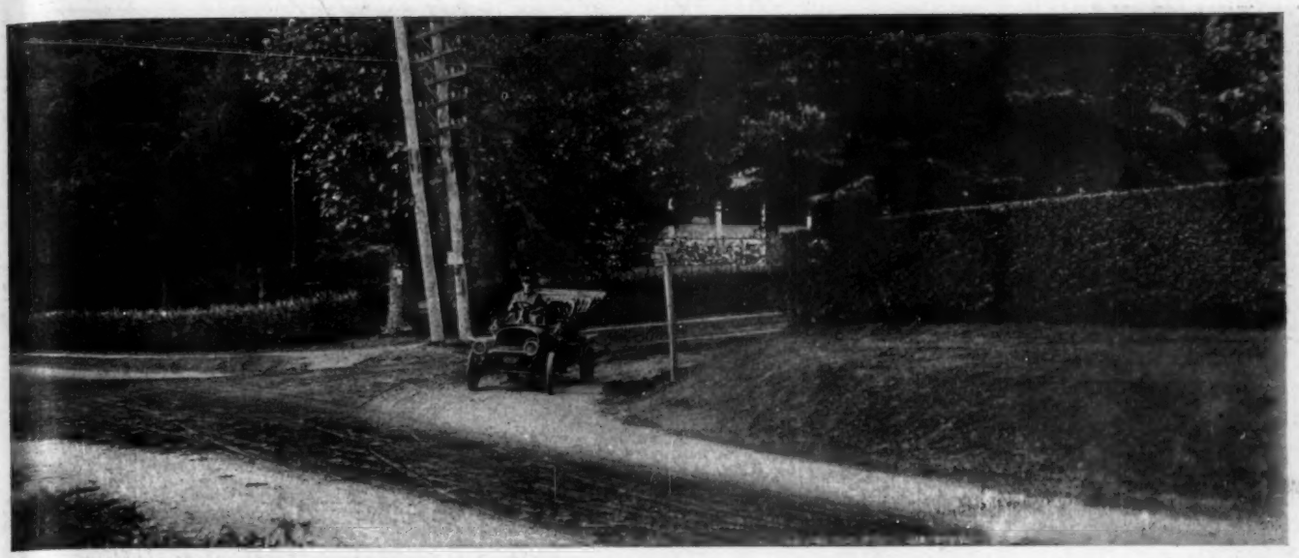
Starting from the intersection of Mineola Avenue, the Jericho Turnpike provides an excellent surface until near Jericho, where some road repairing should be done. From Jericho, northeasterly through Locust Grove, over the Oyster Bay and Jericho Road, it is practically down hill all the way to East Norwich. From East Norwich, southwesterly over the North Hempstead Turnpike, through complacent Brookville, the cars will have a comparatively straight run to Bull's Head Corner. The rolling character of the road does not produce any grade of much account. Then comes the turn southeasterly to Old Westbury, which supplies a swing into the Old Westbury road that will require the exercise of some skill on the part of the driver. Over the Old Westbury road to Mineola avenue, at Roslyn Heights, the road is good, though narrow. It is hilly through Roslyn Heights, and the turn into the North Hempstead Turnpike will call for caution. Through Manhasset road repairing is in progress that will be finished before the race. Passing out of Lower Manhasset, an 8 to 12-per-cent. hill, of perhaps a half-mile in length, will add variety to the route. The road to Lakeville is quite satisfactory.



MAP OF THE NEW VANDERBILT CUP COURSE—ALSO SHOWING THE OLD COURSE.

From Lakeville to Searingtown there are some windings of the road. From Searingtown, southerly over Mineola avenue to the junction of the Jericho Turnpike, a single curve in the road is only slightly difficult. The course is a trifle less than thirty miles, and will be considered a thirty-mile course. Ten times will give 300 miles of racing.

At the clubrooms of the Automobile Club of America on Monday afternoon, the A. A. A. Racing Board, acting principally in its capacity as the Vanderbilt Cup Commission, held a session at which the American Elimination Trial and the Cup Race received general consideration, and many details were decided upon. Chairman Thompson presided. Donor Vanderbilt was present, as were board members Edward Russell Thomas, E. L. Lippitt, F. G. Webb and A. G. Batchelder. Ex-Chairman A. R. Pardington and John Farson, Jr., the latter representing his father, the president of the A. A. A., were in attendance by invi-



WHERE NORTH HEMPSTEAD TURNPIKE SWINGS INTO HYDE PARK ROAD, LEFT AT LAKEVILLE FOR THE LOU WILLETTS ROAD

tation. The same road signs employed in the Grand Prix will be used in the American events, figures on a dark background being more easily read than lettering when going at high speed. The turns of the road, hills, railroad crossing, and villages, will thus be shown by a method extremely satisfactory abroad. The exact location of the grand stand is in doubt, but if the road is wide enough at the point selected each contestant will have a repair and supply place opposite the big stand. At this place only the driver and his mechanic will be allowed to work on the car, though the contestants will have one, and perhaps two, repair stations elsewhere on the course, where no such restriction will be made.

The detachable rim proposition was briefly discussed, the opinion being that American ingenuity will place the Americans on an equality with the foreigners by the date of the Cup Race. Walter Christie has a detachable rim which he offers to supply to the American cars who qualify on September 22. It is also understood that several tire firms will have something of the same sort to announce in the near future.

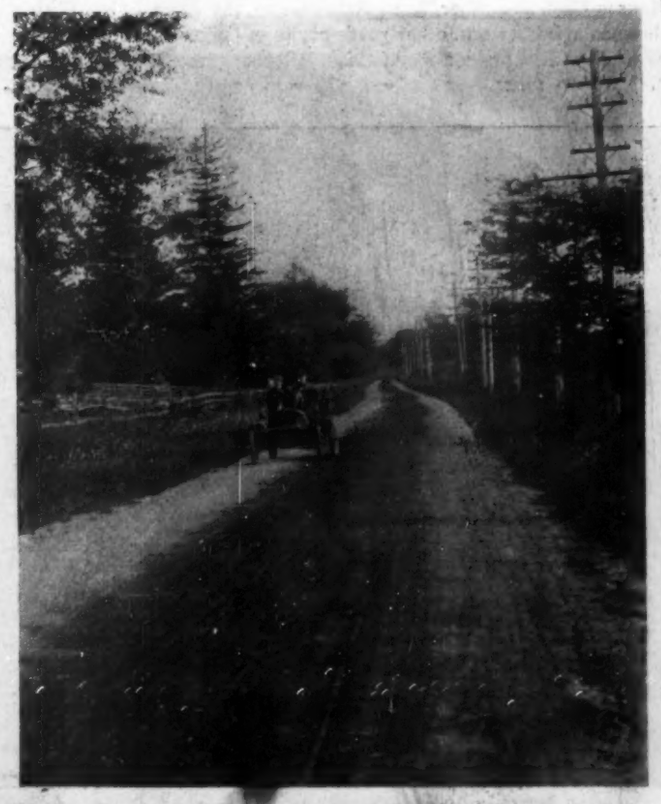
Activities are beginning all over the course, training quarters are being engaged, and inside of the next week several of the American entrants will be comfortably installed. Chairman Thompson intends to see that the speed laws are vigorously enforced, and any persistent violators connected with the race will be brought before the official bar and disciplined in no easy manner. This attitude will be pursued so as to guarantee no interference with the contest itself as a result of injudicious driving before the date of the race. It is expected that opportunity will be provided for a little break-o'-day trying out of the cars at a reasonable speed, but after a specified hour no contestant will be permitted on the course except in a touring car.

Herewith are the fifteen American entries for the quintette that will represent the Stars and Stripes on October 6:

Car.	H.P.	Entered by	Club.	Driver.
Thomas Flyer	115	E. R. Thomas	A. C. Buffalo	Callois.
Thomas Flyer	115	C. A. Coui	Chicago A. C.	Le Blon.
Thomas Flyer	115	H. S. Houpt	New York M. C.	Roberts.
Frayer-Miller	110	O. S. Lear	Columbus A. C.	Frayer.
Frayer-Miller	110	W. J. Miller	Columbus A. C.	Moskovics.
Frayer-Miller	110	J. F. Stone	Columbus A. C.	Belden.
Locomobile	90	S. P. Davis, Jr.	A. C. A.	Tracy.
Haynes	50	E. Haynes	Chicago A. C.	Haynes.
Pope-Toledo	120	A. A. Pope	A. C. A.	Lytle.
Christie	110	W. Christie	A. C. A.	Christie.
Matheson	60	C. A. Singer	A. C. A.	Mongini.
Oldsmobile	80	G. M. Smith	A. C. A.	Keeler.
Maxwell	80	Maxwell-Briscoe Co	New York M. C.	Betz.
Apperson	50	E. L. Apperson	Chicago A. C.	Robertson.
B-L-M	85	B-L-M Co	A. C. A.	Brees.

TRANSMISSIONS FOR FRAYER-MILLER RACERS.

PITTSBURG, August 20.—The Belden Automobile Transmission Company is hurrying to complete the transmissions on the four Frayer-Miller cars built at Columbus, which will be entered in the Vanderbilt race September 22. The company in sixty days will have its big plant, at Twenty-ninth and Smallman streets, in operation. This is a four-story brick building, 120 feet square, and where 500 men will be employed later on. The output will be fifty transmissions per day. Julian Kennedy is president of the company and William Murray is vice-president. R. R. Brown is secretary and treasurer, and E. H. Belden general manager. The capital is $200,000.



LOU WILLETTS ROAD SUPPLIES EXCELLENT GOING TO TURN SOUTHWARD INTO MINEOLA AVENUE.

TURN ON THE LOU WILLETTS ROAD WHICH WILL OCCASION SOME DIFFICULTY UNLESS DRIVER USES CAUTION.

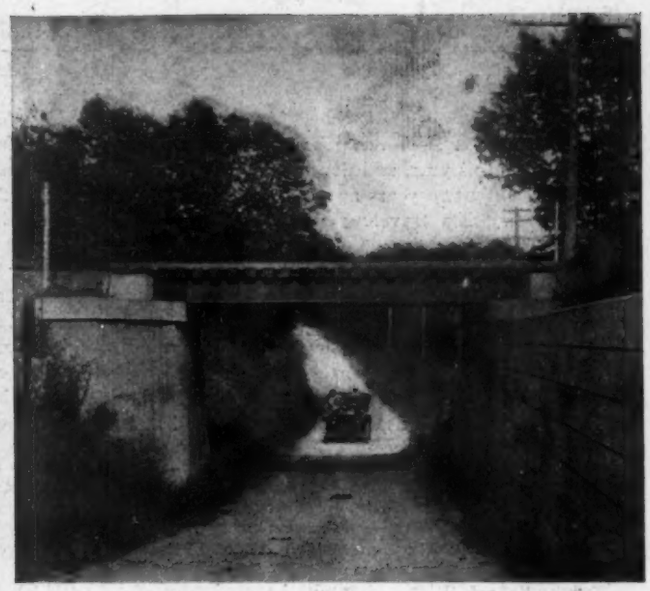
GOVERNOR FOLK'S PLANS FOR GOOD ROADS.

KANSAS CITY, Mo., August 20.—Governor Folk, of Missouri, has a new plan to secure state roads in Missouri. According to a statement by him the other day, he will ask the next Legislature, which convenes in January, 1907, to pass a law requiring the dramshops to pay a state license of $200, this amount to be turned into a fund for state roads. As there are 650 saloons in Kansas City alone, it may easily be seen that the revenue derived would be large. The Governor's plan is to begin the road system with two great highways across the state, one from St. Louis to Kansas City, the other from Arkansas to the Iowa line. With these as a framework, other roads could be built until the state is covered with a network. Of this road plan, the Governor said: "I hope to see a law enacted providing for a state highway commissioner, skilled in roadbuilding. The two highways across the state should be free to all classes of vehicles. It is my view that the highway department of the state should be organized after the same manner as the public school system, to the end that there may be good roads in every portion of the commonwealth."

Missouri will hold a good roads convention at Chillicothe, that state, September 3-8. Public officials and representatives of commercial organizations have been invited, and the meeting may result in an appeal to the governor to convene a special session of the legislature to act on road matters. Promises have been made by eight different firms to compete in the road-building contest, in which prizes are to be awarded for the best stretch of road built, and which will give opportunity to the delegates to view the operations of road-making machinery.

ROAD THROUGH MANHASSET IS BEING REPAIRED, AND WHEN FINISHED WILL HAVE A PERFECT SURFACE.

STRETCH OF NORTH HEMPSTEAD TURNPIKE NEAR MANHASSET



WHERE ROAD GOES UNDERNEATH RAILROAD TRACK NEAR ROSLYN.

THE MAXWELL RACE PREPARATIONS.

Steady progress is being made on the two Maxwell racing cars, one of which is to be selected for the Elimination Trials. The eight-cylinder engine is now installed in its frame, and is being tested thoroughly in all its details. The twelve-cylinder engine is being assembled and will be on the testing blocks during the coming week. Both cars will be run several thousand miles on the road before a selection will be made of the racer.

The Maxwell-Briscoe Company has taken new quarters on the course for both races, those selected a few weeks ago being inadequate. Five acres of land on the Jericho Turnpike, near the Roslyn road and about a quarter of a mile from the start and finish, have been leased. These acres have a frontage of 500 feet on the Turnpike. A portable house, 30x60 feet in size, is now being erected on this land. This will contain a machine shop and storage room for the racer and sleeping and dining rooms for the employees.

In addition, the company has leased a nearby house, where the officials of the company and their guests will be housed. A cafe will also be established in the house.

The Golden Cup of the Automobile Club of Milan has been entirely destroyed by the disastrous fire at the Milan exhibition. It will be remembered that the cup was won by Lancia in the great Milan touring contest only a few weeks ago, in which event the plucky Italian obtained his first complete automobile victory.

BUILDING A VANDERBILT CUP RACER. WORKING ON THE 8-CYLINDER MOTOR AT THE MAXWELL-BRISCOE FACTORY.

AMERICANS USING AMERICAN AUTOS IN EUROPE

By W. F. Bradley

PARIS, Aug. 13.—Never were Americans so numerous in Europe as this year, and never were American automobilists so plentiful. Only two years ago it was the custom for enthusiastic American autoists traveling through Europe to use none but French or German cars, the number of those bringing over a machine built in the states being exceedingly small. This year a decided change has taken place, as is evident not only from personal observation, but from the notices of the arrival of automobile travelers at holiday resorts published in the continental papers. Daily among the list of arrivals on Mercedes, Panhard, Charron, Mors, Brasier and other well-known continental makes, can be seen paragraphs such as the following, picked at random during the past week.

Nantes.—Mr. and Mrs. Presbrey, Mrs. Frank, Mr. Charles and Mr. Vanzile, arrived at the Hotel de France on a 35-horsepower Locomobile, coming from Rennes and covering 280 kilometers to-day.

Como.—W. D. Cousens has arrived at Hotel Plinius on a 32-horsepower Pierce Great Arrow.

Amsterdam.—Maitland Alexander has arrived at the Amstel Hotel on a 45-horsepower Packard.

Vichy.—Mr. Clark, of New York, arrived at Hotel des Ambassadeurs to-day on a 50-horsepower Locomobile.

Milan.—Mr. and Mrs. Fearon arrived at the Hotel de la Ville on a 28-horsepower Pierce Great Arrow, and are leaving for Lucerne.

Amsterdam.—Mr. and Mrs. Tryon and son, of San Francisco, arrived at the Hotel des Pays-Bas on a 45-horsepower Pierce.

Dinard.—F. R. Bacon and family, on a 50-horsepower Pierce, arrived at the Hotel Royal.

Frankfort.—Arrived at the Hotel Frankfurterhof, Mrs. Albert Hall Harris, on a 24-horsepower Packard.

Dinard.—Arrived at the Hotel des Portes, Messrs. Wilkinson and Smith, of Philadelphia, on a 20-horsepower Locomobile.

Amsterdam.—Colonel J. McCulloch, of Marion, Ind., arrived at the Amstel Hotel on a 30-horsepower Pope-Toledo.

Reims.—Mr. Barton and family (Pierce 24-horsepower) arrived at Hotel du Lion d'Or.

Avignon.—Mr. and Mrs. Cyrus Bentley Lime, on a 15-horsepower White steamer, called at the Hotel de l'Europe to-day.

Neuheusen.—M. Alexander, on a Packard 45-horsepower, is at the Hotel Schweizerhof.

Walter Hale, of New York City, made an extensive tour this summer through Spain and France on a 20-horsepower Cleveland. He started from Gibraltar, where his was the second automobile ever seen at the fortified rock, the other one belonging to Lord Charles Beresford.

The Winton Company encourage the owners of their cars to tour through Europe. At present the only European branch of the firm is at London, but this summer a couple of Winton machines have been sent over to Paris, from which point they have started on tours around France with parties of four or five Americans. The first trip was a run of 2,500 miles through the château country, the French Alps, Switzerland and the Rhine, and occupied five weeks. Since then numerous parties have toured round different parts of France, the château district being the favorite, and the scheme has proved a great success. It is intended very shortly to open a branch in Paris, and it is hoped thus to induce Americans coming over to tour to purchase a ready finished vehicle in which they can start right away.

Besides running in the Herkomer Cup contest, Percy Pierce traveled extensively through France and Germany in a Pierce Great Arrow. Mr. and Mrs. H. A. Lozier enjoyed the delights of French roads on a machine bearing their name, and the Thomas Flyer, on which Mr. Thomas, Jr., intended rambling through the Old World this month so delighted his chauffeur that the man disappeared with it.

Preparing for the Next Paris Salon.

Commissaire-Général Rives has no intention of resting on his laurels, and whilst all Paris is away at seaside resorts he is hard at work on the plans for the Automobile Salon from December 7 to 23. The great feature of this year's arrangement will be the abandonment of the glass houses on the river bank, where heavy vehicles and machines have been housed, and the erection of four large temporary halls on the Esplanade des Invalides on the opposite side of the river. The Esplanade, the use of which has been granted by the city of Paris, is the largest open space in the center of the city and formed the heart of the international exhibition of 1900. It is intersected by one main avenue and a couple of cross roads, which the municipality declare must be left intact, and it is for this reason that four buildings, instead of one, must be constructed.

By the acquisition of this land a floor area of nearly 36,000 square yards has been obtained for the annex alone, equal to the entire exhibition area of last year. The temporary buildings, which will be constructed in wood and plaster, so as to resemble permanent stone structures, will be decorated in white, yellow and gold and handsomely finished on the sides facing the river and the main avenue. At night they will be gorgeously illuminated and linked up to the Grand Palais by triumphal arches across the Alexandre III bridge. For a spectacular display no finer site in the world could be obtained. Owing to the heavy expense which will be incurred in the erection of special buildings, it is not expected that a balance will be shown on the right side at the close of this year's show. The deficit will have to be made up by the Automobile Club de France and the three other bodies connected with it in the organization of the Salon.

The Grand Palais, which will, as in previous years, be the center of the exhibit, will have its ground floor exclusively reserved to automobiles. Cycle manufacturers, who previously had a place by the side of the car builders, will be sent on to the upper gallery, where they will be given an increased amount of space and have constructed for them a series of dainty little salons. The tire manufacturers, who have previously held the lower gallery, will also be sent up higher. By this means a largely increased area will be obtained for automobiles proper. As before, the center of the floor space will be reserved to French firms having contributed most to the development of automobiling. The rest of the stands are alotted indiscriminately by the drawing of lots. M. Rives states that it is his intention this year to group the foreign exhibits instead of mixing them with the French firms, as has previously been done.

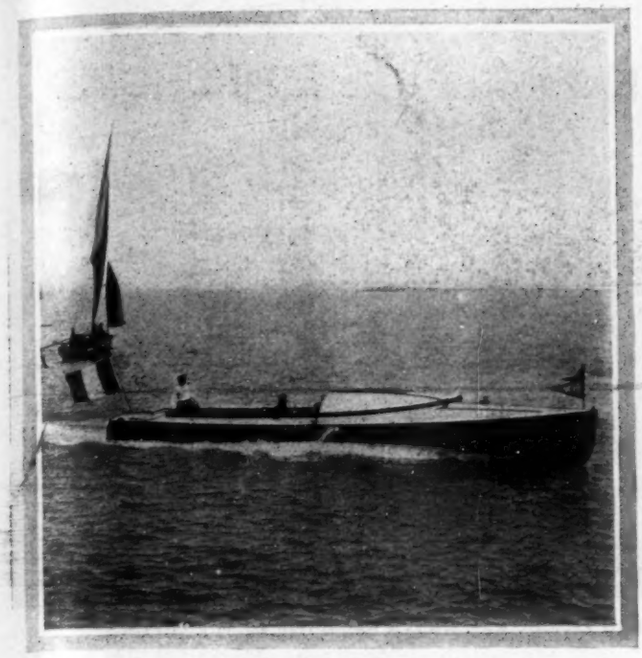
Demands for space are coming in rapidly, already over two hundred firms having made application. British exhibits will this year be numerous; as to American firms, all that is known at present is that the Winton firm intend making a big show. Entries close on September 20, and the drawing of lots for position begins on October 1.

THAT REPORT OF BRITISH ROYAL COMMISSION.

London, Aug. 15.—What Parliament will do with the report of the Royal Commission appointed to investigate necessary alterations in the existing law relating to automobiles is not known, but it is on the whole satisfactory to the British autoist.

Since last October forty-one meetings of the Commission have been held and 122 witnesses, representing every possible shade of opinion, both pro- and anti-motor, were carefully examined. It cannot be denied that much of the credit for the favorable nature of the report is due to the A. C. G. B. I., which acted in conjunction with the Motor Union in presenting the case for the autoist. Some idea of the work undertaken by the club may be gathered from the fact that over 20,000 persons were circularized as to their views on "matters motoring," and that a fund of $18,000 was collected to assist in the work of investigation.

It must be understood that the Commission had no powers other than to frame a report, but it is on this report that next year's new law relating to automobiles will be based.



LA LORRAINE, THE DE DIETRICH WINNER AT TROUVILLE.

LE VOLTIGEUR, A DELAUNAY-BELLEVILLE WHICH WON.

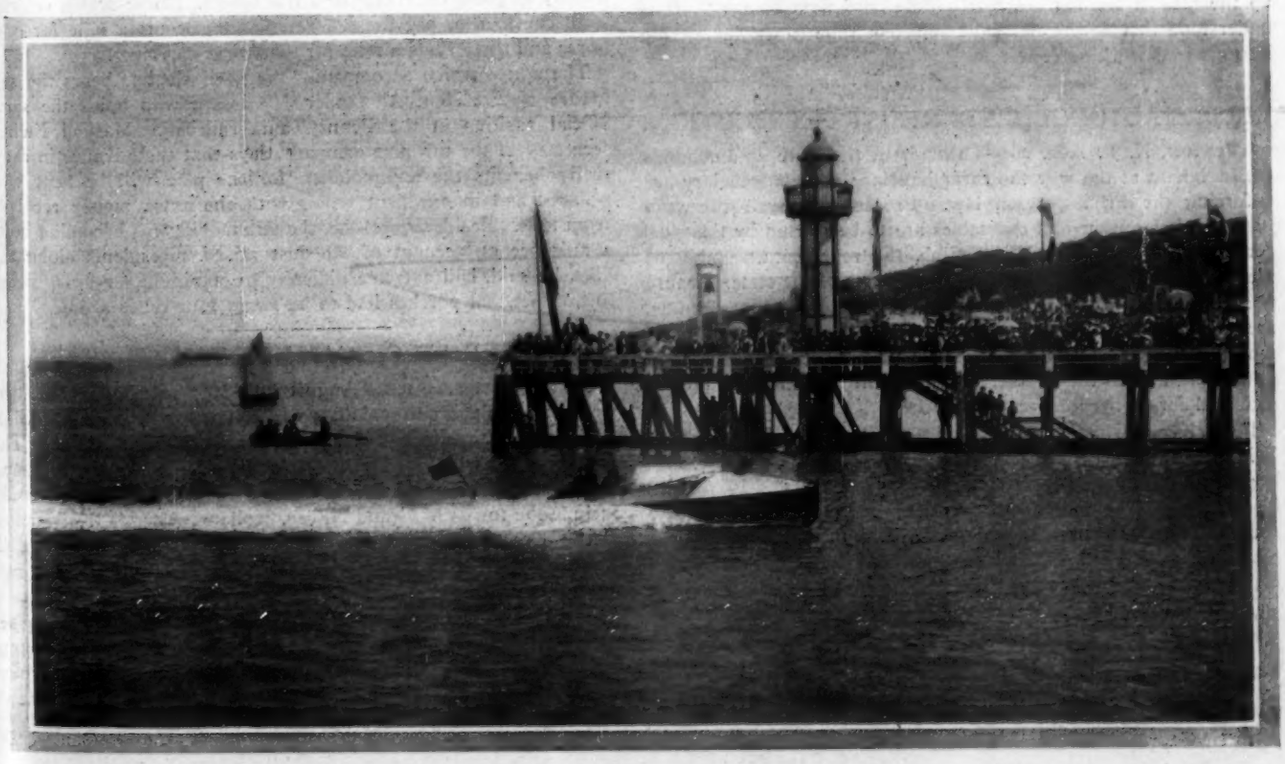
THE MOTOR BOATS AT TROUVILLE.

PARIS, August 7.—The motor boat innings at Trouville was one of the most successful of the season, the entry list being large and the sport excellent, except in the racing class.

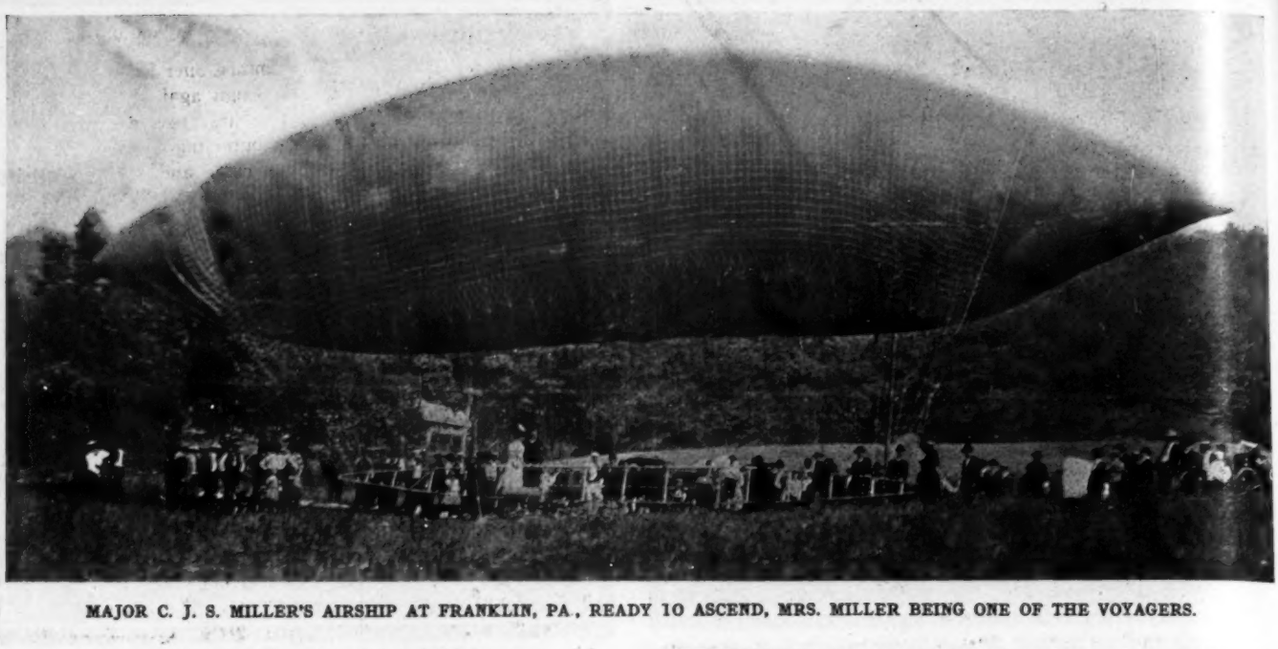
The principal event was the open class for racers, *La Rapiere II.*, unopposed, winning the Trouville Cup. The boat had a Panhard & Levassor motor, and it covered 114 kilometers in 2 hours, 9 minutes, 27 seconds, its speed being at the rate of 53 kilometers an hour. While *Calypso* won the cruiser class at a speed of 40 kilometers an hour, fitted with a Mors motor, *La Lorraine*, with a De Dietrich motor, was only 7 minutes behind in the 114 kilometers. The sea was only fairly calm for the little craft.

In the smaller class *Le Voltigeur*, with a Delaunay-Belleville motor, excelled, its hull being built by Tellier Brothers & Gerard, who also constructed the hull of *La Rapiere II.* In the mile record trial *La Lorraine* was clocked in 329 2-5, as against 333 for *Calypso*.

The annual reliability trials for motor boats in Great Britain took place August 1-2 at Southampton. Twenty-six boats competed and the *Maudslay* secured honors on both days, with the *Nautilus* and *Manapouri* second and third. A new test was introduced the first day, that of reversing, stopping and restarting in a specified time.



LA RAPIERE, WITH PANHARD-LEVASSOR MOTOR, THE UNOPPOSED WINNER OF LA COUPE DE TROUVILLE.



MAJOR C. J. S. MILLER'S AIRSHIP AT FRANKLIN, PA., READY TO ASCEND, MRS. MILLER BEING ONE OF THE VOYAGERS.

THE DOINGS OF THE AIR PILOTS.

Major C. J. S. Miller, the well-known automobilist, this season has devoted a great deal of his time to aerial navigation, and it will be remembered that he had Leo Stevens, the Hoboken, N. J., aeronaut, construct for him an airship, ordered at the time of the A. C. A. show last winter. Recently at Franklin, Pa., Major Miller's home, a successful flight was accomplished, Mrs. Miller being one of the passengers who made the ascension. She expressed herself as delighted with the experience, and intends to accompany the Major on his future trips, which will be resumed in September.

A dispatch from Christiania to the London *Daily Mail* states that letters received from Spitzbergen bring information that, owing to the lateness of the season, Walter Wellman has given up the idea of seeking the North Pole until next summer. It is understood that he did not have sufficient time to get his airship into assured working condition.

JERSEY AUTOMOBILISTS RESIST PERSECUTION.

TRENTON, N. J., Aug. 20.—Throughout the state automobilists are indignant at the way the rural judiciary and constabulary are enforcing the Frelinghuysen law. Proceedings against certain justices of the peace and constables are to be started by the New Jersey Automobile and Motor Club, the representative club of Newark, but which has members in all parts of the state, because it is alleged these officers, under the guise of enforcing the law, are persecuting drivers of automobiles. While large amounts of money for fines have been collected, very little of the cash is finding its way to the state treasury for the good roads fund, as provided for in the new automobile law.

Formal complaint is to be made against Justice of the Peace Willis, of Woodbridge, the accusation being that he has unjustly imposed fines on automobilists who have been arrested by constables without cause and in violation of their rights under the state constitution. The specific case cited will be the arrest and fining of Andrew W. Petit, of New Brunswick. It is claimed that he was arrested on a charge of violating the speed limit and that he was fined $10 in spite of his claims of innocence and his protests against the action of the officials. Automobilists claim that many of the justices of the peace and the constables are in criminal collusion to raid automobilists and mulct them of fines by false testimony, perjury and other unfair means.

PENNSYLVANIA'S BOTHERSOME TOLL-ROADS.

PHILADELPHIA, Aug. 20.—The local automobile organizations are considering the advisability of taking immediate action against the Lancaster Turnpike Company, which recently put into effect a new schedule of toll charges which just about doubles the rates formerly in effect. The minimum charges for runabouts figure up at a trifle over three cents a mile—16 cents for five miles. For the same distance a four-passenger touring car will net the pike company a little over five cents a mile—26 cents—while an even seven cents a mile is charged for six-passenger machines. Local automobilists are up in arms over the unwarranted raise, and are boycotting Lancaster pike whenever possible. Under the new schedule no gatekeeper is allowed to accept less than 10 cents from any automobilist who passes a gate without a through ticket—despite the fact that his car may be a small runabout and that he may be going but a mile or a few blocks. Horse-drawn vehicles shall continue to pay the old rates of two cents a mile for one-horse and three cents a mile for two-horse carriages.

The notice which accompanies the new schedule bears the signature of President Alexander J. Cassatt, who holds the same official position in the Pennsylvania railroad. Maskell Ewing, secretary of the turnpike company, says that the advance in rates really benefits the automobilist, for the pike will be kept well watered and in excellent repair with the extra money received from tolls. Besides, quoth he, the automobile was becoming quite a nuisance on account of the dust raised. Residents along the pike, he said, had extreme difficulty in obtaining servants, owing to the fact that porches had to be swept four times a day.

WESTERN MICHIGAN RUN TAKING SHAPE.

GRAND RAPIDS, MICH., August 20.—If present plans mature, western Michigan automobilists will compete in a miniature Glidden tour within the boundaries of the State of Michigan. The run proposed will be entirely confined to Michigan territory and the start will probably be made from this city. The run could include the towns of Grand Haven, Holland, Allegan, Kalamazoo, Battle Creek, Jackson, Ann Arbor, Detroit, Pontiac, Howell, Lansing, and Grand Ledge and back to Grand Rapids. This run is finding the most favor.

Efforts are being made to secure a trophy, and, if this is secured, plans for the race will be rapidly completed. Of course the best roads will be sought, with just enough poor roads thrown in to make the contest interesting. As in the Glidden tour, all repairs to machines will be made on the road.

CATECHISM OF THE GASOLINE AUTOMOBILE*—VIII

By FORREST R. JONES, M.E.

Q.—WHAT voltage will answer for the primary of an induction coil?

A.—Two classes of coils are found on the market, one taking about four volts and the other six or seven. It is well to find from the maker what voltage should be used. It should be marked on the box.

Q.—How do you test a battery to determine whether it will give enough current to make a strong ignition spark?

A.—Measure both voltage and current (amperes) with a voltmeter and ammeter. The two instruments are frequently combined in one. To measure the voltage, place the terminals of the voltmeter on the battery terminals. The voltage will then be shown by the reading on the graduated scale of the voltmeter, provided care has been taken to bring the terminals of the battery and the instrument into good metallic contact. The battery will not be damaged by keeping the voltmeter on it.

To measure the amperes, place one terminal of the ammeter on a terminal of the battery, and strike the other battery terminal with the free ammeter terminal, making the contact as short as possible. A good battery should throw the needle over with considerable force. The ammeter should never be connected with the battery longer than is necessary for the needle to come to rest, since it causes it to run down very rapidly.

If a very delicate ammeter for measuring very small currents (milli-ammeter) is at hand, it can be used to measure the current that flows through the induction coil when the trembler is vibrating. The indication will generally be much less than an ampere. Some makers state what it should be for their coils.

Q.—How is a storage battery charged?

A.—By connecting it in circuit with lamps, sufficient in number to give the current that the battery requires. This is usually stated in the directions on the battery. Or the battery may be charged by the use of electrical apparatus especially for the purpose. The ammeter can be put into circuit with the battery.

The terminals of the battery are marked (+) and (—). Immerse the ends of the charging wires in water before connecting to the battery; bubbles of gas will collect in much greater quantity on the negative wire, which should be connected to the (—) terminal of the battery, and the other to the (+) terminal.

Q.—How would you use the batteries when two are carried for an engine?

A.—Use one constantly and hold the other in reserve. Test the reserve battery daily by switching it on for an instant when running. Do not let a piece of metal lie on top of the batteries. It may short circuit them and thus run them down.

Q.—If both batteries are run down too far to give ignition, how can they be arranged to work a while longer?

A.—Connect them (the batteries, not the cells) in multiple first. If they fail again, then connect all the cells in series.

Q.—How can an exhausted dry cell be temporarily revived?

A.—By making a hole in the top and putting water in it.

Q.—In placing cells in position for a battery, what care should be taken?

A.—The binding post or zinc of one cell should not touch another cell. The paper cover prevents the zinc from touching. If the cells are likely to become wet, place pieces of rubber or window glass between them. The cells should be firmly held in place in the battery box to prevent shaking and loosening of wire connections.

Q.—What are some of the troubles that occur in jump spark igniters (spark plugs)?

A.—Carbon and grease collect on the insulation and, in mica plugs, between the disks of mica, thus causing a short circuit, which prevents sparking between the points inside the cylinder. The porcelain cracks. The spark points may come too close together or be too far apart. The spark gap should be about 1-32 of an inch.

The remedy for a dirty spark plug is to clean it with gasoline and a stiff bristle brush. A piece of cloth will sometimes answer. Do not scrape with a knife. There is no remedy for a broken porcelain or loose disks in a mica plug. They must be replaced by new parts or a new plug. Extra plugs should always be carried to meet such troubles.

A defective or dirty spark plug can sometimes be made to operate by using an auxiliary spark gap outside of the combustion chamber. A simple method of doing this is to use a fiber false terminal at the spark plug and connect the wire to it so that the shortest distance between the end of the wire and the binding screw of the spark plug is about 1-16 of an inch. The spark will then have to jump from the wire across this gap in order to pass between the spark points.

Q.—What troubles may come in an induction coil? How can they be remedied?

A.—The contact points of the trembler may become oxidized by action of the small electric arc which forms when they separate. The oxide of the metal forms an insulation between the two points, and prevents flow of the current, thus putting the coil out of action. The remedy is to clean the contact points by rubbing a piece of paper or very fine emery cloth between them.

Foreign matter from any source may possibly get between the points and prevent their coming together. It may be blown out or scraped off with a knife, a piece of paper or emery cloth.

The spring may become bent by accident so that the vibrator will not operate correctly or at all. The remedy is, of course, to straighten it or readjust the screws.

The contact points may become loose in their fastenings. The vibrator may rub against some part of the mechanism. Water may get between the contact points and prevent the breaking of the circuit.

Loose connection of the wires on the binding posts on the outside of the box may cause trouble, and should be tightened. Other troubles are generally not easily repaired, although a loose connection or broken wire inside the outer box may be soldered. Other troubles, which seldom occur, may be failure of the insulation inside coil, or a broken wire. Such faults can be repaired satisfactorily only by the manufacturer of such apparatus.

Q.—What troubles may develop in a timer?

A.—The springs for bringing the parts in contact may become weak or broken; the parts may wear away so as not to close the circuit; dirt may get between the contact parts; wear may allow metal parts to come into contact that should not, and thus close the circuit at the wrong time; the rotor may get loose on the shaft and slip around so as to alter the time of closing the circuit.

Q.—What troubles may come in the carbureter?

A.—The float may stick so that it cannot rise to close the needle valve and gasoline will overflow (flooding). Tap the

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Editor's Note: The installments that have appeared in these pages, together with much additional matter and diagrams, are now obtainable in pocketbook form, under the title of the "Automobile Catechism," from the publishers of THE AUTOMOBILE, at a cost of $2.00 a copy.

carbureter, striking it lightly. Remove the top of the carbureter and lift up the float.

A cork float may become "waterlogged." Remove, dry out by warming and varnish with shellac.

A hollow metal float may leak and become filled with gasoline. Remove from carbureter, put in hot water and locate leak by bubbles from hole. Punch a minute hole in it with a sharp point, solder the leak, and test by blowing into the hole. Then allow the float to cool completely and solder the punched hole with a soldering iron, taking care to heat the float as little as possible.

The inlet needle valve may leak. Press down hard on seat. Press down lightly and rotate. Grind in with fine emery or powdered pumice stone mixed with oil or vaseline. Press down lightly and rotate when grinding. Carefully remove all abrasive material when finished.

Dirt may clog the inlet valve or nozzle. Close and open the inlet valve. Wash out with gasoline. Run a fine wire through the nozzle.

The regulating needle valve may be moved by something striking it or by vibration. Readjust. Tighten the packing gland.

Frost may collect so as to obstruct air (mixture) passage. May occur in hot, dry weather, but is more apt to come in damp weather. It will generally thaw by heat from the engine after the latter is stopped. If not, hold one or more inlet valves open and crank the engine or run it with the cylinders whose valves are allowed to work in the usual manner. Pour on hot water from the cooling system.

Water may splash in and freeze. If in one pipe to one of the cylinders only, hold the mixture inlet valve of that cylinder open and run the engine. If there is any passage for the mixture some will be drawn into the cylinder, heated and forced back through the pipe. Crank the engine by hand with inlet held open, if it will not run by its own power.

The throttle valve may stick while running. If caused by frost, remedy as in previous paragraph.

Water in gasoline will stop the engine. Open the valve or remove the plug at the bottom of the gasoline reservoir of the carbureter. If there is no opening at the bottom, siphon out with a piece of rubber tubing, a bent pipe, or remove the carbureter and pour out the contents.

Stoppage in the pipe connections. If a gasket or other packing is used in the gasoline pipe, the passage may be stopped by the packing becoming squeezed out into it. Remove the obstruction.

Gasoline may not flow in after supply has been completely exhausted and gravity tank refilled. Blow into gasoline tank so as to cause air pressure above the gasoline.

Q.—What are some of the causes of irregular explosions (misfiring) when full impulse is developed at each explosion that occurs?

A.—Dirty or defective spark plug.

Make-and-break contacts corroded or oxidized.

Battery run down.

Battery too powerful.

Magneto brushes worn away.

Magneto commutator worn out of round.

Trembler of induction coil out of adjustment.

Loose contact on vibrator.

Contacts of induction coil corroded or oxidized.

Dirt in timer, weak springs in timer.

Timer worn so that contacts do not come together to close circuit; or so that parts which should not touch come together and close circuit at wrong time.

Timer shaft does not connect metallically (electrically) with body of engine on account of a film of oil surrounding the timer shaft journals.

Timer rotor loose on shaft.

Wiring defective.

Loose connection in wiring. (Battery wire; ground wires; timer wires).

Wire broken inside of insulation.

Insulation worn off so that the movement of the wire caused by the motion of the car brings it into contact at intervals with the frame of the machine or some other part, so as to cause a short circuit.

Poor insulation on high tension wire (spark plug wire).

Weak inlet valve spring.

Sticking or binding of valve stem in guide. Due to dirt or crooked stem.

Water in a leaky cylinder.

Q.—If an engine misfires, what test can be made on the road to locate the fault when jump spark ignition is used?

A.—Tests in the following order can be made until the trouble is found:

Switch on the reserve battery while still running.

Hold down the tremblers on the induction coil one at a time, or in pairs, to determine which cylinder misfires.

Stop the engine and crank slowly, noting whether each trembler vibrates strongly. If all vibrate weakly look for loose connections in the battery, the ground wires and the wire connecting the battery to the induction coil. Also examine for a broken wire inside the insulation of the same wires. Look for bare places on the wire between the battery and coils.

If only one vibrator has weak action, clean the contact points, readjust its tension and examine the wire and connections between it and the timer. Examine the timer, noting whether the contacts and spring for the weak trembler are in order.

If all tremblers vibrate strongly:

Remove the wire from the spark plug, hold its end about 1-4 inch from the engine casting, and close the circuit for that plug at the timer by turning the engine crank or placing a piece of metal so as to connect the timer terminal for that plug to the frame of the engine. The spark should jump the 1-4-inch gap. If not, look for poor insulation on the secondary wire.

Remove the spark plug, connect its wire to it, lay the bushing of the plug against the engine and close the primary circuit corresponding to the plug under test. Notice whether the spark is strong between the plug points. If not, clean the plug or replace it with another. Even though the spark is strong when the plug is removed from the cylinder, the current may pass through mica insulation or dirt and grease on the insulating material when the plug is in the engine, owing to the higher resistance of the spark gap in the compressed mixture.

Put in a new spark plug.

Q.—If the engine does not give full power, the circulating water heats more than usual, misfires begin and increase in number, what may be the cause?

A.—A cracked cylinder. A leaky plug between the water jacket and the combustion chamber.

Q.—If the engine gives somewhat less than full power, but runs steadily without misfiring, what may cause the trouble?

A.—A slight leak. It may be at a valve, the piston, the ignition plug, or other parts attached to the cylinder. The leak would affect the compression but slightly as shown by hand cranking. Put lubricating oil around the spark plug and other stopped openings into the cylinder, and watch for bubbles when testing for compression.

Improper mixture, caused by the carbureter being out of adjustment, or by a leak in the pipes between the carbureter and the cylinder casting.

Q.—If the engine runs well for a time, then requires further advancing of the spark than usual, loses power while exploding regularly and possibly gains power again, even with the spark retarded, what may be the cause of the trouble?

A.—The rotor of the timer may be somewhat loose on its shaft and slip backward gradually. When it has lost nearly a quarter of a revolution in a four-cylinder four-stroke cycle engine, it is in a position to run well if the spark control lever is placed farther in the retard position than usual.

HOW THE SPUR GEAR DIFFERENTIAL WORKS

THE "spur gear" differential is designed to perform exactly the same functions as the "bevel gear" differential, described last week. As its name indicates, however, it differs in the form of the gears employed: these are all "spur" gears or toothed wheels in which the teeth are formed radially in the circumference of the wheel. These gears should not be confused with the gear or sprocket wheel which imparts motion derived from the transmission mechanism to the rear axle; for in the case of a car with propeller shaft drive the connection between the driving shaft and the driven axle usually takes the form of a pair of bevel gears, and where a center chain drive is used a sprocket wheel takes the place of the bevel gear on the rear axle.

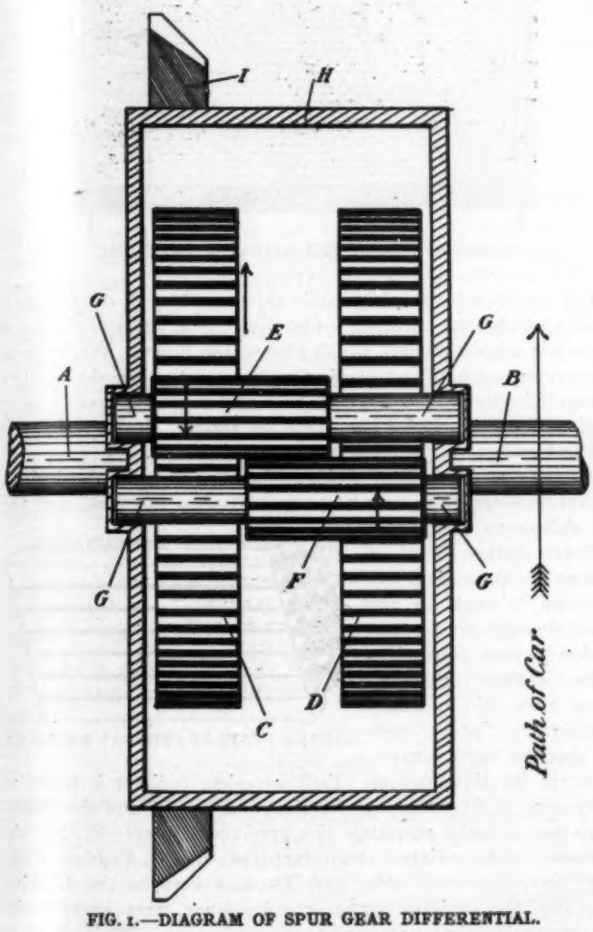


FIG. 1.—DIAGRAM OF SPUR GEAR DIFFERENTIAL.

Casing cut away and only one pair of pinions shown. Bevel gear *I* is the driving gear and meshes with bevel pinion on rear end of propeller shaft, not shown. With single chain drive, a sprocket replaces the bevel gear.

Fig. 1 shows diagrammatically a spur gear differential with part of the casing cut away, and one pair of pinions, the others being omitted for the sake of clearness. As in the case of the bevel gear, as many pinions may be used as there is room for, or as may be considered necessary. A structural difference between the bevel gear and the spur gear differentials is that the pinions of the bevel gear are carried by the circumference of the gear casing, with their axes radial to the axis of the axle, while in the spur gear the pinions are carried by the radial walls of the casing, with their axes parallel with the axis of the axle.

In the drawing *A* and *B* are the two halves of the divided rear axle, with spur gears *C* and *D* rigidly secured to their inner ends. Spur pinions *E* and *F* form the connecting link between the two gears, pinion *E* meshing with gear *C* and pinion *F* meshing with gear *D*. The peculiar feature of the pinions is that they are of such width as to extend beyond their respective gears and mesh with each other—pinion *E* meshes with pinion *F*, and each meshes with its gear also. It will be noticed, however, that neither pinion is so wide as to cross the space between the gears and so mesh with both *C* and *D*. From the ends of the pinions project journals *G G G G*, extending into bearings formed in the walls of the casing *H*. These bearings are closed at their outer ends so that oil placed in the casing for the lubrication of the gears and bearings is retained, while dust is excluded. A bevel gear *I* secured to the casing *H* meshes with a bevel pinion on the rear end of the propeller shaft: or else a sprocket is fitted for single chain drive, this part of the system being the same as with the bevel gear differential.

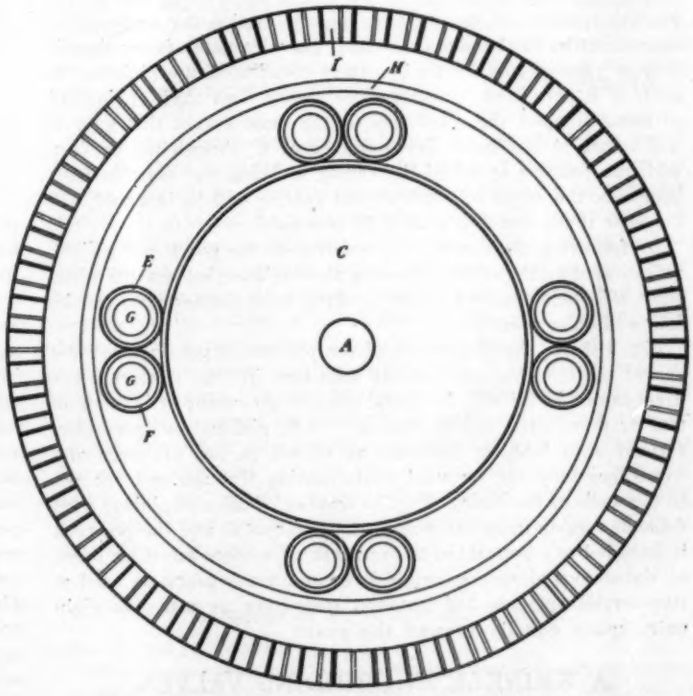


FIG. 2.—DIAGRAM SHOWING ARRANGEMENT OF SPUR PINIONS.

Corresponding parts in Figs. 1 and 2 are similarly lettered. Parts are slightly reduced in size in this diagram. From three to eight pairs of pinions are used in actual practice.

With regard to the movements of the gears and pinions when the differential is in action, it should be remembered that the differential is merely a train of gearing, and that by assuming any desired conditions the movements can be followed from gear to gear and the results readily understood. Suppose we are standing at the rear of the car, looking down at the differential, Fig. 1. With the car moving forward the drive will be from bevel gear *I* through the casing *H* to the pinions *E* and *F*, and from the pinions to the shafts *A and B* through their gears *C* and *D*. The whole differential will rotate at the same speed as the casing *H* and bevel gear *I* as long as the car is running straight ahead and the road wheels are rotating at equal speeds. The reason for this will be apparent upon following up the direction of the rotative tendencies of the gears and pinions. If pinions *E* and *F* were not meshed with each other, but only with their gears, *C* and *D*, and casing *H* was rotated by the driving bevel gears, the pinions would roll around on the gears with a planetary motion without driving either, and the direction of rotation of the pinions would

be forward—the same as the direction of the casing and bevel gear. It is obvious that two gears cannot run in the same direction when meshed, however; and when the two pinions are meshed in the differential, the only way they can rotate on their own axes is to rotate in *opposite* directions.

We now have power applied to pinions *E* and *F* tending to turn them on their own axes in the same direction; but this they cannot do because they are meshed. On the other hand, both pinions have a tendency to drive their gears backward, but this again would necessitate the pinions rotating in the same direction on their own axes, which is prevented by their meshing. Thus the rotative tendencies of the pinions counterbalance each other and the pinions are relatively stationary, but rotate bodily in an orbit about the axis of the shafts *A* and *B*, carrying with them the gears *C* and *D*.

Suppose, however, that shaft *B* is held so it cannot turn, as would be the case if the car made such a sharp turn that the wheel attached to shaft *B* acted merely as a pivot, without turning on its axis. Gear *D*, being rigidly secured to shaft *B*, is stationary, but gear *C* is still rotating. Pinion *F* rotates on its axis, rolling forward on gear *D*, and pinion *E* rotates in the *opposite* direction to pinion *F*, impelling gear *C* forward with the motion due to the pinion's rotation on its own axis *plus* the motion due to the planetary rotation of the pinions, so that gear *C* rotates faster than if it were rotated only by the planetary rotation of the pinions. If shaft *B* is permitted to rotate more slowly than shaft *A*, instead of being stopped, the result will be the same except that gear *D* will rotate in the same direction as gear *C*, though not so fast, and, the rotative speed of the casing *H* being the same in both instances, the speed of shaft *A* and gear *C* will be less and will decrease if the speed of gear *D* is increased.

By following the direction of rotation of the gears and pinions as indicated by the arrows showing their relative movements when shaft *B* is held stationary, the working of the differential can be followed quite readily.

Fig. 2 shows the disposition of the pinions in pairs around the gears: the lettering corresponds with that in Fig. 1, so that the parts can be identified. In actual practice the casing *H* is made in two or more parts bolted together. The pinions are sometimes formed with integral journals, as shown in the drawing, and sometimes they run on steel studs passing through and secured to the walls of the casing *H*. The number of pairs of pinions used depends largely upon the size of the differential and the power it is intended to transmit: in the smallest sizes there are three pairs, or six pinions altogether, while large and heavy gears, as used in commercial vehicles, for instance, may have as many as eight pairs space equally around the gears.

A WRINKLE IN GRINDING VALVES.

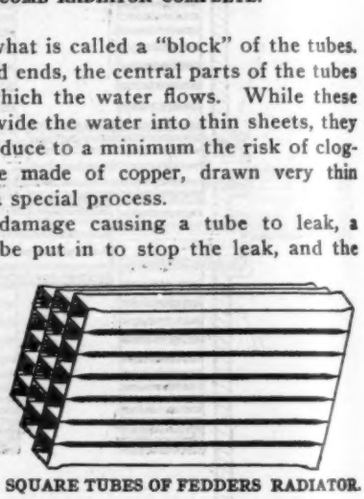
Grinding in valves is at best a dirty and troublesome job, and when fine flour of emery is used, it is also a very long one. Owners of cars who look after their own vehicles will find the following tip, which has been sent in to me by a friendly motorist, of value, says a writer in *The Motor News* (Ireland). Procure a piece of fairly fine emery cloth, and cut out a disk of slightly larger diameter than the valve head, making a small hole through the center of a size to just pass the valve stem. Thread this disk of emery cloth up the stem with its rough surface upward, and insert the valve in its seat, and proceed to grind it in the usual way. When a fairly good surface has been obtained on the valve, remove the emery cloth and replace the other way about, proceeding again to grind in. This time the valve seat will be attacked by the emery cloth. When a good surface has been obtained here the emery cloth may be removed, and the valve ground in in the usual way with flour emery and a little oil. The result is that the rough grinding away of the pitted surface can in this way be done in half the time and without any dirt, while the finishing cut to make a tight joint is soon accomplished. Where the valves are badly pitted a coarse grade of emery paper to start with, followed by a finer grade, and, finally, flour emery, makes the work easier and quicker.

AMERICAN-MADE HONEYCOMB RADIATOR.

Radiators of the square tube honeycomb type are manufactured in an ingenious and interesting way by the Fedders Manufacturing Works, of Buffalo, N. Y. A large number of short, square tubes, with their ends enlarged, are packed together in layers, as shown in the accompanying drawing of a small section of a radiator, and the ends of the tubes are soldered together, forming what is called a "block" of the tubes. Kept apart by the enlarged ends, the central parts of the tubes form passages through which the water flows. While these passages are small and divide the water into thin sheets, they are sufficiently large to reduce to a minimum the risk of clogging. The tubes used are made of copper, drawn very thin in the Fedders works by a special process.

FEDDERS HONEYCOMB RADIATOR COMPLETE.

In case of accidental damage causing a tube to leak, a square wooden plug can be put in to stop the leak, and the car driven to the garage without further loss of water. A permanent repair can be made by any good tinsmith, who can solder a new tube into place without anything more than his ordinary apparatus. Spare tubes are supplied by the manufacturers for this purpose. Each complete radiator is tested to a pressure of fifteen pounds to the square inch, and the honeycomb part is tested separately to a pressure of twenty-five pounds.



SQUARE TUBES OF FEDDERS RADIATOR.

Honeycomb radiators manufactured by the Fedders company were on the Pierce and Thomas cars in the Glidden tour and, the radiator manufacturers state, gave every satisfaction during that gruelling test.

HOW TO AVOID PINCHING THE TUBE.

To avoid pinching of inner tubes in tires, the following practical hint will prove of value: Lay a good coat of talc on the tube and set same round very carefully with the pump before introducing it under the shoe. Do not exaggerate the laying of the talc; the best way to do it is to impregnate a clean rag with talc, and pass that rag all over the slightly inflated tube until the surface is soft and slippery. Inflate the tube until it forms only very slight folds inside its circumference when you hold it high. Pass both hands carefully all around the rim, inside, and underneath the tube, to be sure there are no folds of any kind. If there is a fold, and you cannot get rid of it, do not hesitate to take the tube out of the rim and do the operation all over again."

LETTERS INTERESTING AND INSTRUCTIVE

More About Simplifying Water-cooling Systems.

Editor THE AUTOMOBILE:

[367.]—In following out the changes suggested by Dr. James H. Wroth, relative to the water circulation of his automobile, which suggestion met your approval, I could not see in what manner the second plan held any superiority over the first. This latter, I take it, describes the present way the car is constructed. He is correct, surely, in having the cold water enter the cylinders at the top, but he conducts the hot water from the cylinders to the lower part of the radiator, contrary to good practice, a point you make in your reply. Hot water descends as it is cooled and consequently it should be taken from the lower point of the radiator to the tank. The way he has located the pump between the radiator and the tank is faulty in the extreme. I have a mental picture of the geyser that would result at the overflow pipe in the tank, were the engine to start to work. The water would be forced into the tank, and, unless hermetically sealed, which is not the case, as an overflow pipe is provided, it would not find its way to the cylinders. If the rubber connections give trouble they probably can be renewed with better material, which might give results. To change as outlined in Diagram No. 2 of your last issue would not, and in fact, to my mind, would give more trouble, in fact be impracticable.

JOHN W. FEW, JR.

Middletown, Pa.

Through an inadvertence the two illustrations accompanying the letter to which you refer were transposed. Diagram II represents the cooling system as it was, and Diagram I shows the suggested changes. Had you read the text, you would have seen the error, since in his letter Dr. Wroth clearly states the piping "should be reversed, so that the cooling of the radiator would bring the cooler stratum to the bottom before going to the tank"—requiring, of course, that it enter the radiator at the top. In our reply, it is stated with equal clearness that the "hot water from the cylinder should enter the *top* of the radiator, since its natural tendency is to descend as it is cooled"—quite contrary to what you have assumed us to say. As for your ideas concerning rubber tubing, does not our reply state that "rubber hose of good quality should give no trouble"? We note you say that Dr. Wroth "is correct, surely, in having the cold water enter the cylinders at the top." This is just the one point in the alterations he proposes most open to criticism, for, as stated in our reply, "some of the foremost automobile engineers strongly advocate introducing it just beneath the exhaust valves, in which case it tends to rise through the jacket in a natural manner as it is heated."

The Transverse Spring in Front.

Editor THE AUTOMOBILE:

[368.]—Is the use of a single, inverted half-elliptic spring, placed crosswise at the front of a car, as in the Packard touring car of 1905, and in the Ford runabout of this year, simply an expedient to cheapen construction, or is it defensible on some more substantial ground?

THOS. J. CAMERON.

Paris, Texas.

The use of the spring arrangement to which you refer is by no means a mere method of cheapening construction, though it undoubtedly costs less to build than the commoner plan of having two half-elliptic springs, placed longitudinally. It is an objection to the latter design that the springs must be attached to the axle at points well away from the wheels, if the wheels are to be permitted the wide range of steering movement necessary in taking short curves. This objection is avoided by the transverse spring, since it permits the weight of the front of the car to be supported upon axle at points very close to the steering pivots, thus very much reducing bending stresses on the axle.

It will readily be understood that the closer to the wheels the weight of the car is carried, the less tendency there is for the axle to bend, just as it is much more difficult to bend or break a stick by grasping it close to its point of support than by applying pressure at a distance from the point of support.

A Bad Case of Pounding and Pre-ignition.

Editor THE AUTOMOBILE:

[369.]—The letter that appeared in your August 9 issue relative to "Pounding and Pre-ignition" has interested me very much, but it gives no remedy for the trouble. I have a two-cylinder touring car, 1906 pattern, and ever since I got it in March from the factory it has run hot and pounded, and won't develop the proper power, especially for climbing the slightest grades on the high speed and some ordinary grades it will even pound on second speed. I am sure the trouble is such as explained in "Pounding and Pre-ignition" of the first kind described.

If you or any of your subscribers can furnish me with suggestions to correct or prevent this thumping and pre-ignition I will highly appreciate it. Some have told me it was bad oil and carbon in the cylinders. I have scraped and cleaned these out several times and have used nearly every good oil made, but the trouble remains just the same. The circulation has been carefully examined and seems to be all right. The carbureter has been changed and adjusted in every conceivable way, but it did no good. The engine will run hot and continue to revolve and pound around several times after the switch plug has been removed from the spark coil, when you stop the car. This has occurred when the car has been run only a short distance on level road. I hope you can offer some method of corercting this evil.

F. N. TEMPLE.

Cincinnati, O.

Since you have looked unsuccessfully for the trouble in every other direction, probably it is due to incorrect valve or ignition timing, or to both. First try the ignition, testing it at different points. If it is too far advanced the engine will pound and fail to develop proper power, just as you say. The heating is less explicable on this ground, though too early ignition will cause some heating. In its normal condition, an automobile engine should run fairly hot; is it not possible that your engine is no hotter than it should be? Do you have any back-kicks of the starting crank when starting the engine? This would indicate too early ignition. If for any reason the exhaust valve is opening too late, or opens insufficiently, it would account for all your troubles, though it seems hardly probable that its action can have become so deranged. If you continue to have trouble, why not call upon the nearest agent? Any expert should be able to diagnose and rectify such a difficulty as yours very easily if permitted to inspect the car.

A Matter of Valve Lift and Timing.

Editor THE AUTOMOBILE:

[370.]—As a subscriber to your paper, I desire to ask you a few questions about a two-cylinder engine, four-cycle, five-inch bore by six-inch stroke, on a touring car made by the United States Long Distance Automobile Company of Jersey City. The inlet valves lift ⅛ inch; the exhaust valves lift ¼ inch. The engine doesn't seem to have much power especially when the car is on the lower speeds. I do not think the valves lift enough to admit sufficient gas. Inlet valves are two inches; exhaust valves are two and one-eighth inches. Can you tell me how high the valves should raise, also how to time them properly?

PERRY YARNS.

Uniondale, Pa.

A valve lift of only one-eighth of an inch—the valve being two inches in diameter—seems very small for a five by six cylinder. Nevertheless, if, as you say, the engine seems particularly weak at low speeds, the valve timing would be a more likely cause of the trouble. The exhaust valve should open slightly before the termination of the power stroke, and should close practically on dead center at the end of the exhaust stroke. The inlet valve should open just after the exhaust valve closes, and should remain open for several degrees after the compression stroke is commenced. The exact points for valve opening and closing cannot be stated in a general way, since they vary in accordance with the make and design of the engine, its normal piston speeds, etc. Most manufacturers make a practice of marking the rim of the fly-

wheel, by punch marks or otherwise, to show the exact valve and ignition settings. We do not know whether or not the car you are using is thus marked, but it might pay you to investigate. Correction of the timing, should it prove to be wrong, is a matter of regrinding the cam outline, unless slight lengthening or shortening of the valve stem will be sufficient to correct a correspondingly slight error. In speaking of low power at low speeds, do you mean on the lower gears, when the engine runs at high speed? If so, your theory about the valve lift is undoubtedly correct. The area of your inlet ports is 3.1416 square inches (minus the area of the valve stem), while the annular opening afforded by the lift is only 0.7854 square inch—altogether too small for your engine. This lift should be nearly if not quite doubled, if the average practice of automobile engineers be accepted. The area of the exhaust-valve port is 3.5465 square inches, with an annular opening of 1.67. This, too, seems rather small, but not so seriously so as in the other case.

Appreciates a Good Word for Tires.

Editor THE AUTOMOBILE:

[371.]—You have done the automobile tire manufacturing business as a whole a substantial favor by printing so prominently in your issue of August 9 the communication, "Believes in Fair Play for Tires." It is a note out of the ordinary because it is a good word for the one theory upon which the comfort of automobiling must so largely depend. The more usual course is to give little or no thought to the tires until something happens to them, and then to find fault in no soft terms.

The industry of tire-making is second in importance only to motor car manufacture, and there is much more live capital invested in it than in any other accessory in the field. And it is safe to say that in no other direction is so much care, time and money spent in trying to get the very best results. For one thing, competition has always been extremely keen, despite the vastly overestimated and recently much-discussed tire association, and the dissolution of this organization on August 31 opens the business absolutely wide.

Here as elsewhere every possible improvement is being searched out with the greatest care; witness, for example, the new rush to get out the detachable rims since the now-famous victory of Szisz in the last Grand Prix. We are very close to the ultimate results in present methods of treating rubber and fabric—the component parts from which the automobile public demand that we fit all sorts of road vehicles, to be run at all speeds, in more severe all-around use than any other automobile accessory is subject.

There will be less fault found with tires just as soon as autoists find out how to use them properly, both on the road and in the garage. In the first place, they must be bought with judgment, as to the load they can carry with safety and economy of use; and this is not always wise to leave entirely to the manufacturer of the motor car. Especially not when it comes to commercial vehicles, in connection with which there are points that should be discussed directly with the tire-maker or his representatives, personally or by correspondence.

The vice-president of one large tire company and one of his local managers dropped into a first-class garage not far from New York the other day for the special purpose of noting the inflation of the tires. Out of 42 cars on the garage floor only three were properly inflated at all of the four wheels, and there were double that number absolutely unfit, so far as inflation is concerned, to go out of the garage, though out they went as occasion demanded, with little or no thought of consequences. The majority of chauffeurs don't care, and the majority of owners are either ignorant or careless, sometimes both.

Most of these cases are echoed back to the tire manufacturer in the shape of claims for defective material or poor workmanship; and this is part of the explanation of the various guarantees that don't guarantee, "jug-handled guarantees," as they are often referred to by members of the trade. To allow outright every claim that reaches the various factories would be to put probably every one of them into bankruptcy. However, every tire-maker is willing to replace his goods whenever the failure is due to some source where either the material or workmanship is at fault; but he does not feel like shouldering a wider area of blame.

The guarantee on automobile tires is a direct inheritance from the intense rivalry of bicycle days; and if rightly considered by both parties it would be a good thing—a much better thing than it is now, when users expect too much, and manufacturers (somewhat in self-defense) are perhaps willing to grant too little in some cases. A lot of trouble is with the chauffeur, who takes it for granted that "tire troubles" can be made a ready excuse for any shortcomings, including his own carelessness. With the "grafting" chauffeur and the unscrupulous dealer this sort of thing is capable of infinite applicaton.

Autoists starting from a garage, either for a run about town or for a day's long trip, should look as carefully to their tires as to their gasoline or oil supply. Were this the universal, rather than the exceptional, practice it would be an economy to the user as well as a saving of infinite trouble to the manufacturer. With the crude, wet rubber well above a dollar a pound before it comes north of the Equator, tires are necessarily expensive; and price tendencies are upward rather than downward. "Substitutes" are out of the question as long as autoists demand the luxury which air inclosed in rubber alone can supply. Good care will save expense and add to safety and comfort of pneumatics, while the very best equipment of tires can be ruined by the carelessness of a half day.

TIRE MANUFACTURER.

How the Premiers Lost Points in Chicago.

Editor THE AUTOMOBILE:

[372.]—In the Chicago-Elgin-Aurora Reliability Run three Premier cars were entered. The committee awarded a perfect score to one, penalized one two points, and one twenty-five points. The car which was penalized two points was two minutes late at the Chicago control.

In order to reach this control over the prescribed route, cars were compelled to pass over the Jackson boulevard drawbridge. This drawbridge is just one mile from the control. Many drivers, comparative strangers in the city of Chicago, were in charge of the cars. When some of the cars were approaching the drawbridge and were on schedule time, the draw was opened and they were detained a few minutes. The Premier Company protested officially against the decision of the committee in penalizing this car two points for being two minutes late at the control.

After taking up the matter with the committee we are advised by them that "congestion of traffic was an excuse for but one thing only, and that changing of speed levers." In other words, the bridge might have been open two minutes or two hours, and the drivers could content themselves with changing the speed levers, but would not be released from penalization for being late.

The other instance in which a Premier car was penalized twenty-five points occurred on the Watch Tower Hill at Elgin. In this instance the Premier car was following another touring car up the hill, when the driver of the first car found himself unable to take the hill on the high gear, and, in his attempt to shift gears, lost control of the car, which started to run backwards. In order to avoid collision the driver of the Premier car took the ditch, stopping his car and motor. For this he was penalized 25 points.

We scarcely see the tenability of the contention upon the part of the committee in penalizing these cars, and think it no more than fair that the public should be advised of the conditions. We would be very pleased to have an investigation of our statement made, and would add that all facts have been laid before the committee both personally and in correspondence, and we are certain that any such inquiry will result in a confirmation of the statements herein contained.

PREMIER MOTOR MFG. CO.,
Indianapolis, Ind. R. I. EADS, Sales Manager.

Considers It Has a Successful Alcohol Engine.

Editor THE AUTOMOBILE:

[373.]—We note an article in your issue of July 12, on page 62, headed "Motors Running on Alcohol," in which you state the first successful American alcohol engine has just been produced.

We see you are a little behind the times, and desire to call your attention to the fact that over a year ago we conducted a series of experiments with the low grade alcohols which we had exported from Cuba, and have been furnishing alcohol engines for that trade ever since. We are prepared to furnish not only stationary engines, but marine engines and other types to be operated with alcohol. We are not calling your attention to this for advertising purposes, but we wish merely to correct your error.

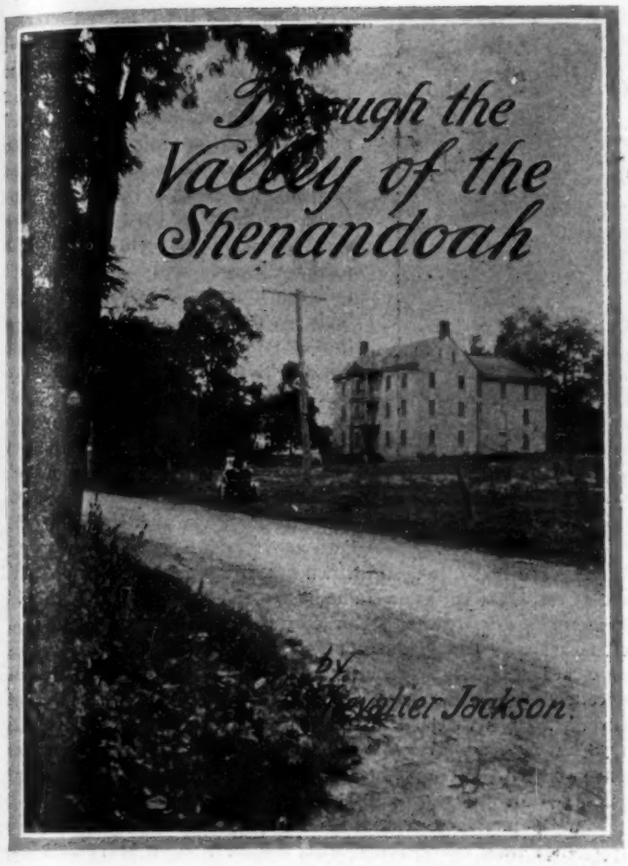
Peru, Indiana. E. A. MYERS.

How It Appears to a User of Graphite.

Editor THE AUTOMOBILE:

[374.]—In your issue of July 26 the Joseph Dixon Crucible Company hit the nail on the head under "Graphite as a Cylinder Lubricant." I have had more than fifteen years' experience with graphite and am not through with it yet, and do not expect to be for some time. Mixed with non-fluid oil or any grease which will feed through any ordinary grease cup, it is the best lubricator for all bearings on an automobile where such grease is used and is the only fit combination for ball and roller bearings on automobiles and especially in wheel bearings. Here oil is of but little use, as it will not "stand by" for any length of time and runs out, lubricating almost everything but the bearing. Graphite is an excellent thing in all cases where severe work is demanded in bearings of all kinds and a fair trial will convince anyone. A. M. BROWN.

Westover, Pa.



THE VALLEY PIKE INVITINGLY STRETCHES BELOW WINCHESTER.

OUR cottage veranda with its hickory rockers never looked so inviting as when we left it that morning in June. The birds were singing, the sun was rising, the dew was on the grass, but the touring fever had us in its relentless grasp, and tour we must. We headed our little car eastward, wended our way through Allegheny's and Pittsburg's dirty streets and smoky atmosphere to Wilkinsburg, where Penn avenue ends in the old Greensburg pike. This led us over newly macadamized surface to Turtle Creek, where we turned off to the left and followed the trolley tracks to Wilmerding, where a right turn took us over the creek and the Pennsylvania railroad tracks to another trolley line, which was followed to the left and up the hill a mile to East McKeesport, fifteen miles from Pittsburg. Here a left turn brought us again to the old Greensburg pike, which is nearly a century old, and it looks it. Abandoned to the weather, with only the mud from the gutters shoveled onto its surface, not for the purpose of repair so much as to permit the farmer to "work out" his taxes. Stewartsville, Circleville and Jacksonville are still quaint old road towns, delightfully quiet and restful. A view of them on an early Sunday morning in June makes the overwrought city dweller question whether the city din and strife are worth while. Irwin, and, still more so, Greensburg, are towns made wealthy by the coal and coke industries, and many beautiful residences adorn the green hillsides. Gasoline at a furniture store and storage in a fine, large livery stable at Greensburg proved satisfactory, save that furniture stores are not open on Sunday. On the western outskirts of Greensburg the old home of Doctor Cowan, the writer, stands on a knoll. It is used as a barracks for the state constabulary, a mounted force of about 100 men, who patrol the mining districts. What their attitude may be toward automobilists we did not know, and we were not yearning to learn by personal encounter. Certain it is no one could break the speed laws, for the roads are so abominably bad that his springs or his bones would break first!

From Greensburg south to Mount Pleasant the road is clay, and in execrable condition, save after a long drought. The last three miles are a makeshift macadam, made by putting the broken limestone there and waiting for traffic to pack it down, instead of rolling it. The old portions are good, but the parts newly covered with freshly broken limestone, with angles and edges as sharp as glass, are anguish to the automobilist. Rubber tires do not make a good stone roller, and ours did not come through unscathed, though nowhere cut through to the fabric, and they held out until we reached that night's shelter.

Mount Pleasant received its name in the early part of this century, before the advent of the unlovely coke oven. It described it then, but Mount Unpleasant is suggested to us as we approach the town from the north. Great clouds of black smoke rising above the horizon are visible miles before the place is reached. On closer approach miles of coke ovens, surrounded by baked, desolate wastes where the smoke and heat have killed, burnt and blackened the vegetation, miles of side track with cars laden with coal and coke, betoken the industry which makes the town. Farther west some fine residences are to be seen, but we did not go that way. We turned eastward over the old Glade road, later known as the West Newton and Bedford turnpike. It is a better road now than the old Pittsburg and Philadelphia pike through Ligonier. Toll is charged and this augured some kind of road repair. Three miles east of Mount Pleasant, Laurelville, with its quaint old abandoned grist mill, marks the western foot of Chestnut Ridge. Just as the ascent begins a watering trough marks a great gushing spring of ice-cold water, one of many encountered along the two-mile climb before the summit is reached. The surface is good enough here for the direct drive if the machine has the power. A descent of two miles with some good coasts brought us to the east foot, one mile beyond which is Donegal, where we had a good dinner and good sleep, with the cool mountain air blowing in the room windows. Toll gates are now left behind and the road gets worse and worse. The ascent of Laurel Ridge begins and a six-mile climb carries us through the notch in the ridge which the old engineers, three-quarters of a century ago, took advantage of to get over the mountain.

The road here is quite sandy, never muddy, but always rough from the bare washed stones of the old pike foundation. The scenery is grand, but the rough roads shake you up so you cannot see it. Coasting down through Bakersville and Levansville we come to Somerset, 74 miles from Pittsburg. A large summer hotel as the town is approached affords a beautiful view and is agreeably located for those who prefer country to town hotels. Somerset was an important town on the old stage line. It enjoys a smokeless coal which is bituminous and not anthracite.

Rain, which had been threatening all day, now fell in torrents, and we sat on the spacious veranda and watched the mists gather and fade on the distant Allegheny mountains. A beautiful rainbow, with one limb extending down between us and the range, was enjoyed with no misgivings as to the effect of the rain on the roads in the mountains, for these roads are sand and rocks, and are better than ever after a rain.

The Allegheny mountain pikes in Pennsylvania are easily followed by THE AUTOMOBILE Official A. A. A. Blue Book, almost with the eyes shut—only if your eyes were shut you would never know by the feel that you were on a road. I have driven a car twice over the ties along the railroad, and I must say that the thumps and jerks on your spine are much the same, only regular on the railroad. If the man who named the Allegheny mountains had gone over them by the present roads, he would have called them the Rocky mountains. In many places we felt as if we were riding through a stone quarry, but the beautiful green mountain ridges, with their

THE BLUE JUNIATA AS IT FOLLOWS THE PITTSBURG AND PHILADELPHIA PIKE

blooms of chestnut trees, their laurels, rhododendrons, Indian pinks; the beautiful ferns, the odor of the woods, the spearmint, mountain tea, sweet brier and the wild rose—all these things are to be found at their best, and they make the trip a delight.

Leaving Somerset, which is of 2,800 feet elevation, there are a few ascents and descents before reaching Rocksburg, where the ascent of the Allegheny mountains begins. Many of the grades can be taken on the high gear if the machine is powerful enough to take them slowly. The surface is too rocky to run more than eight or ten miles an hour. After the summit is passed the road improves somewhat, but is rough in places, though never deep in mud, owing to its rock foundation and the sandy soil. After six miles down grade we reach Mann's Choice, a real country town, visible when two miles away, as it nestles far below in a pocket at the foot of Wills mountain, along which skirts the south (Ray's Hill) branch of the Blue Juniata. Four miles farther on the road intersects the direct Pittsburg and Philadelphia pike, at a point marked by a large stone house, having two tiers of balconies. An eighth of a mile farther on stands an old stone mile-post, whose weathered lettering can be deciphered "P 93 M" (Pittsburg 93 miles). We cross the Juniata by an old weatherworn, covered bridge and arrive at Bedford.

Bedford is a quaint old town with a few stone buildings that antedate the Revolution. One of these has been an inn for over a century. I found an old book at Winchester, Va., which gave an account of a boy who came out of the Virginia woods and saw the plastered interior of this inn. He did not believe it was made by human hands, because he could see no joist timbers, and did not know that houses were ever made of anything but logs. The court house contains court records of the time of George III. One sentence recorded is that the prisoner shall have both ears cut off, shall be publicly flogged and pay a fine and undergo imprisonment at hard labor. This was all for a single crime—horse stealing. What would the King's court have done to an auto thief?

Two roads run from Bedford to Cumberland, one on each side of Wills Mountain, which they parallel, but do not cross. The one that skirts the east foot, via Centreville, is the better. It was very rough for us, because sod had just been thrown out of the ditches into the middle of the road, but after traffic has worn that smoother it should be good in dry weather. Our rear sprocket sawed through sod clods, which certainly did not assist lubrication. Twelve inches of clearance would have been none too much. Three miles of excellent new macadam leading into Cumberland was a pleasant surprise. This Bedford to Cumberland road was cut through in 1758 for the transportation of supplies for General Forbes' expedition to Fort Duquesne. The Maryland line is crossed twenty-four miles south of Bedford.

The Pennsylvania law makes it a misdemeanor to display any other than the Pennsylvania number. The Maryland law compels you to have your number on both front lamps. Consequently you must either violate the law or carry a sign painter with you to paint the numerals on your lamps in the mountains when you cross the border. Coming back you get out and scrape the numbers off. Possibly some genius will invent an attachable and detachable number arrangement for the lamps, so we can have an addition to the junk of which we already carry too much. He might invent a revolving number card like a street car sign for the number tags. We had six dangling under our tailboard on this trip.

After dinner at Cumberland we went out Baltimore avenue, that ends in the old Baltimore turnpike. This is in fair condition, though the rolls and dips show where the winter mudholes were. The road ascending Martin's mountain is good and the eastern descent is a fine coast. Flintstone at the western foot of the ridge is a quaint place, nestling in the mountain close to Flintstone Creek. In the twenty-seven miles from Flintstone to Hancock there are five mountains to ascend. They are not very high, compared with the White mountains, and the grades are not over 10 per cent. The surfaces are rough and washed in places, and water springs are not as plentiful as in the Alleghenies. But the scenery is beautiful. We started at 6:30 and it was a delightful ride up through the fog and mist to the clear bright sunshine above. As we reached the summit of Polish mountain a beautiful sea of fog spread beneath us, with the higher peaks pushing up through like green islands in the sea. Berkeley Springs is only six miles over a fair road from Hancock, and if a stop is desired it is better to go

AN OLD MILL, SIMILAR TO MANY OTHERS, THIS ONE BEING NEAR BEDFORD, PA.

the extra six miles to the Springs. Leaving Hancock the road skirts Cove Ridge, Timber Ridge and Pig Skin Ridge. It follows the Chesapeake and Ohio canal for a few miles until the Potomac begins its windings. Here, as in all the old pikes, it strikes out in a direct line for its objective point, up hill and down dale. Where it follows the canal the Wabash railroad has pushed it now to one side, now to the other, of its original course, relocating it in many places. We cross Great Tonolowa and Licking creeks, and then begin the ascent of Fairview mountain. About two miles we climbed and then coasted about two miles to Clear Spring. After crossing the Conococheague toll is paid and we spin along over a fine macadam road for about eight miles, getting into Hagerstown just as great raindrops begin to fall from the clouds.

THE SHARPSBURG PIKE RUNS DIRECTLY THROUGH HISTORIC ANTIETAM BATTLEFIELD.

Hagerstown is the key to the Shenandoah Valley of Virginia. Any one wishing to enjoy the 150 miles straightaway stretch of fine limestone pike through one of the garden spots of America, with side trips over excellent roads to delightful springs and summer resorts, with historic points at every turn, with gasoline at every town, with road courtesies to the autoist if he deserves them—any one who wishes to enjoy these things without submitting his machine and his party to the tortures of the abominable northern roads intervening between him and Hagerstown, had better ship his machine to the latter city. From Pittsburg to Hagerstown with the aid of the Blue Book the road is easily found. The scenery is grand, but the roads are rough. From the east Hagerstown is reachable over better roads by way of Harrisburg and Chambersburg, or, better, Gettysburg. The sailor's idea of heaven was a place walled about with tobacco. The autoist's (at least a Western Pennsylvania autoist's) idea of heaven is a centre surrounded by good roads. By this criterion, Hagerstown is automobile heaven.

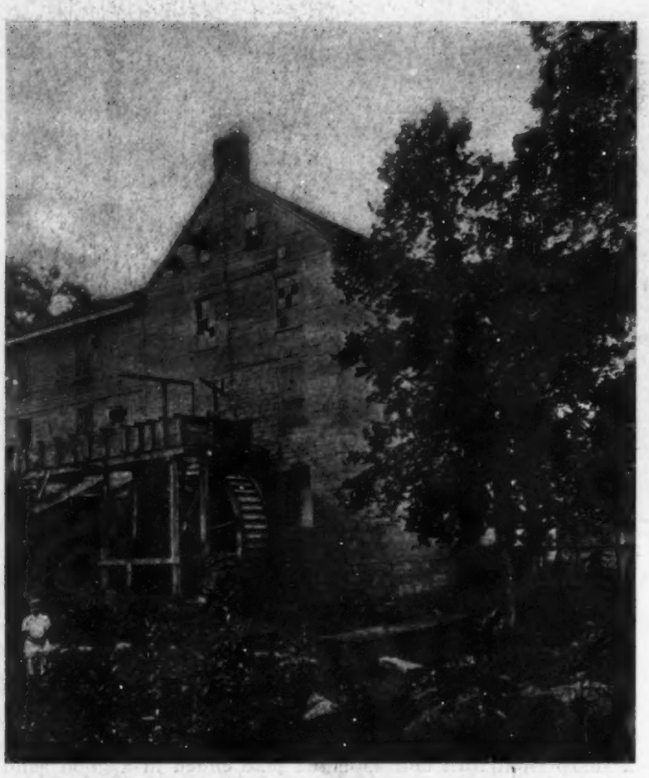
From Hagerstown good roads radiate in every direction. Northern people are wont to speak of the lack of progressiveness at the South, but when it comes to roads, Maryland, Virginia and West Virginia are far ahead of Pennsylvania. Excellent limestone turnpikes extend for miles, most of them toll roads. In nearly all this country limestone abounds and it is near the surface. Dig a hole almost anywhere adjoining the road and you come upon a vein of limestone ready for the crusher and roller. But Pennsylvania is almost as well supplied, and it is inexcusable that there is not a continuous thirty miles of good road in the entire Keystone state. In Hagerstown no horses were frightened by the machine, for the local automobile factory has the streets constantly full of machines with temporary bodies, "running the motors in" and "tuning up." Using Hagerstown as a base, we toured north to Chambersburg and Gettysburg, east to Baltimore, and made shorter trips in various directions.

Leaving Hagerstown we took the Sharpsburg pike, ten miles of excellent macadam brought us to the Antietam battlefield. Along the roadside in the clover and grain fields, along the fences, were tablets and monuments erected by states, communities, regiments and individuals to the memory of men, regiments and commanders. Cast-iron tablets gave the locations of various lines. Burnside's bridge, over which the contestants alternately surged and were driven back, is an odd old structure. Several days could be spent here, but we regretfully moved on.

At Sharpsburg, twelve miles from Hagerstown, we made a sharp right turn and soon the pike ended in a good sand road which we followed three miles to Shepardstown, where we crossed the Potomac into West Virginia and made a sharp left turn, at the old log blacksmith shop, into the Halltown turnpike. About two miles out of Shepardstown we took the left fork to Harper's Ferry. The soul must be dead that does not thrill at the view upon reaching the hilltop overlooking the valley of the Potomac, where the Shanandoah joins it, between the Elk Ridge and the Blue Ridge mountains, at Harper's Ferry. The old canal winding at the base of the mountain adds quaint repose to the picture. Good hotel accommodations, the grand view, the rumble of the Potomac as it rushes over its bed of solid rock far below, the constant cool breeze, tempted us to loiter, and we rested two days. We sympathized here with the poor wife of the speed and schedule fiend, who refused to let her linger a day or two when she wished to enjoy an agreeable place because he had "his tour laid out and timed."

About two miles from Halltown, on the way to Harper's Ferry, John Brown's fort may be seen in a field far back to the south of the road, at a point where the road comes out

A GLIMPSE FROM THE HILLTOP OF PICTURESQUE HARPER'S FERRY.



AN OLD MILL ON THE ROAD OVER WHICH SHERIDAN MADE HIS MEMORABLE RIDE.

high on a ridge. It is a dark red brick building and is readily missed unless watched for. Nothing remains of the old musket works on the Potomac nor of the rifle works on the Shenandoah. The old mill races are used by the paper mills which occupy each site.

There is always a cool breeze night and day throughout the hottest summer on the portion of Harper's Ferry known as the Hill Top, over which the pike enters the town. This Hill Top is occupied by summer hotels, patronized chiefly by Washington and Baltimore people. The picturesque grandeur of Harper's Ferry is marred and the eye offended by the hideous advertisement on the rocks of a toilet preparation. Yankee enterprise is at times an abomination.

Leaving Harper's Ferry, we retraced our way four miles to Halltown, where we took the left fork and went on four miles to Charlestown, where we intended to get our West Virginia license. Pride in our geographical knowledge got a severe "jolt" when we inquired for the state auditor's office and learned that it was 200 miles away, at Charleston, on the Kanawha. Charlestown is a delightful southern town, with wide streets, shaded with grand old elms and maples. There are many quaint houses and cottages and a profusion of flowers on the green lawns.

Taking a sharp left turn into the Charlestown and Berryville pike, a good road, on which toll at the rate of five cents a mile is charged, we were soon in Berryville. Here our road ended at right angles in the old Winchester and Washington pike. Eastwardly this road extends through Castleman's Ferry, crossing the Blue Ridge through Snicker's Gap, and on through Leesburg to Washington, D. C. It is said to be in good condition except some mountain portions. Turning southwesterly, we were delighted to find a toll gate. There has been much scolding in the automobile literature on this subject of toll gates. For my part, I am always delighted to see one, for it means better roads ahead. In this case we were not disappointed. To my dying day I shall always remember that ride from Berryville to Winchester. The road was smoother than any Pittsburg park road. There were only two water breakers the entire distance, no bumps and no sand in the hollows, so that they could be rushed, and with flywheel momentum the three hills were taken on the direct drive with our little overloaded 7-horsepower runabout. There was no dust and no bugs; goggles were useless. There was not a cloud in the sky as we sped along, with spark at full advance and throttle almost closed, for the most of the road is nearly level. Far to the west the great North mountain of the Allegheny range; to the east, the far-off Blue Ridge mountains, gave distance to the picture, while nearer were the beautiful rolling Virginia farms, with here and there a grand old classic mansion showing in a clump of native forest trees, fine horses and cattle grazing in the meadows, yellow waving fields of grain. At the roadside the bluets, the cleomies, the milk flowers, the mullein, the sainfoins, formed a continuous flower bordered roadway.

The law of Virginia permits what might be called a penal toll. The turnpike companies, private corporations, are permitted to charge at the rate of five cents per mile for an auto seating two people, while a horse-drawn vehicle of similar capacity pays two cents per mile. The roads are worth the price, but penalizing the automobile is scarcely just. The companies claim that they are put to trouble keeping a register of the machines. This is some trouble to theautoist, too. Some toll keepers register you, others hand you the book. You enter your name, place of residence, number of your Virginia license, the date and time of day, and the bearing by compass of your objective point. By a singular omission you are not asked whether you are hauling your wife or only your best girl! The toll gates are five, sometimes ten, miles apart. To stop every five miles to register, exhibit your certificate and wait for an illiterate to decipher it and compare it with your tag plate is a nuisance. The adoption of the act is optional with county or municipal authorities, but practically all have now adopted it. This law requires the operator of the machine overtaking a horse-drawn vehicle, if commanded to do so by the driver, to get out and hold the horse, while at the same time he operates his machine past. Failure to perform this phenomenal feat at command renders him guilty of a misdemeanor and liable to a fine not exceeding $100 or thirty days' imprisonment, or both. The operator who has never handled a horse in his life may prefer jail to "tackling" a rearing, plunging four year old who is seeing his first machine.

Winchester is a historic town, the commercial and social center of the Shenandoah Valley. It is justly proud of the deeds of its citizens in four wars. The war of 1812 did not come home to it as did the other three, of which a record is seen in many places. As I sit on the veranda overlooking the peaceful town of Winchester this balmy Sunday morning in July, the church bells are ringing, the cows are lowing, the red birds, cat birds, quail and yellow warblers are making music. I cannot help thinking of those other days, when the roar of musketry and ordnance was continuous, when the town was the bone of contention in the fiercest war ever waged. Winchester changed hands eighty times between 1861 and 1865—four times in one day. Eight thousand graves in the National and Confederate cemeteries here bear witness. After all—*cui bono?*

There are no trolley lines or street cars of any kind in Winchester, nor indeed in any of the Valley towns. This is really remarkable—a string of towns 150 miles long, totaling 100,000 people, and no trolley lines, nothing but a very poor railway service of three trains each way daily, and three changes of cars if you start from Winchester. This condition of affairs probably accounts for the good roads.

After resting Sunday we took the road from Winchester south to Middletown. As far as the first toll gate (about one mile) this is the road over which Sheridan set out upon his famous ride. At this point he left the pike by the west fork, as he heard that his men were retreating that way. Middletown, where the fight occurred which he turned from retreat

to victory is thirteen, not twenty, miles from Winchester by the direct pike, though it is about sixteen by the road he took. He ought to have had no trouble in making ten miles an hour over such roads—with no tires to repair on the way, and no stops to be registered every few miles. The smoothness of the road (the pike portion), was demonstrated by the keeper of our log book, who made notes while the machine was going at full speed—and this in a machine of short wheelbase. From Newmarket a clay road, usually good, leads over Massanutten mountain, which is formed by the meeting of the east and west Fort mountains to Luray Caverns. They are well worth a visit and make an objective point for a day trip. Hotel accommodations may be had at Luray, one mile from the Caverns.

The Valley pike all the way from Hagerstown, Md., to Staunton, Va., is a good limestone road. From Staunton the tour may be extended over sandy clay roads, good in dry weather and quickly drying after rain, to Natural Bridge in Rockbridge County. While somewhat hilly, there is nothing insurmountable to the low gear of a runabout in good order. Some machines have gone on through to Roanoke, but they report it an inadvisable trip.

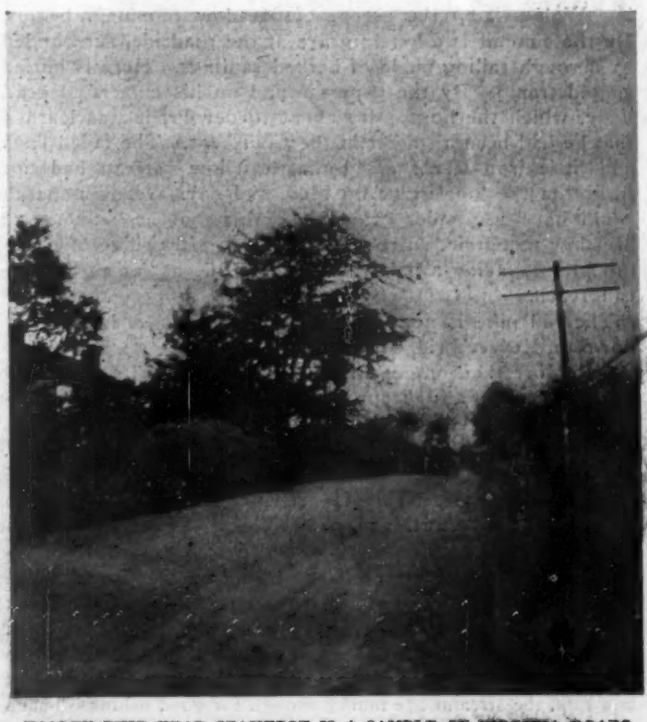
Staunton is a very old town. During the revolution its citizens defied Tarlton, who had chased the Legislative Assembly from Richmond, and later from Charlottesville, and the Assembly was protected until it finished its session. Staunton is to the south end of the Shenandoah Valley what Winchester is to the northern section. In addition it has always been a noted educational center for the south. As in other towns of the valley, little or no manufacturing is done, the fuel is mostly wood. Water power is still much used. Gasoline engines are coming into use, and the oil trust has several gasoline storage tanks in the valley. Gasoline stoves are common, though the wickless kerosene stove is rapidly supplanting them. Gasoline is good at Winchester and cheap (16 cents) at a large printing house using gasoline engines for power. In many places in the valley it does not test over 65 and sensitive carbureters will have to be re-adjusted.

After zigzagging up, down and across every highway and by-way in the valley, we started late in the forenoon of a beautiful day in July westward from Winchester over the Northwestern turnpike. A few white "cotton" scuds were flying over the crest of Great North Mountain of the Allegheny range as we headed for it. We sped along over a rolling road through the beautiful Shenandoah valley farms. The giant thistles by the wayside blended into a lavender ribbon along each side of our gray streak of smooth roadway. We crossed Hogue Creek, then Black Creek. These are fords, and the latter is quite deep, making a loud hiss as our muffler went under, and our machine was noiseless as our exhaust pipe was submerged, but it did not come up to our intake, so we came through. The water fortunately, was clear, so that we avoided being "hung up" with our rear sprocket ridden up onto a rock. In times of high water this road should not be taken. At the ford the toll gates are left behind and the road deteriorates. We skirt the north end of Little North mountain, pass through Goreville, and the ascent of Great North mountain begins. It is not a hard climb, the surface is fair here, the road winding in and out around sharp curves.

The grades can be taken "on the high" by a high powered machine over the first ridge. The second ridge is rougher and steeper. Reaching the summit, which is the state line, as frequently occurs at the south, we coast down a rocky and deep sandy surface into the town of Capon Bridge, W. Va., twenty miles from Winchester, Va. We cross the Great Cacapon river and get a good dinner at a delightful boarding house on the river bank. Bass fishing is good here and the temptation to stop and fish was great when we saw a boy with a string of twenty beautiful bass, averaging about a pound each. But like the "Excelsior" youth, we went on up the North River mountain slope over Timber Ridge, in which we nearly stalled in the hub-deep sand, then over Sandy Ridge, less sandy than the first ridge. Here we took off our chain and cleaned it and the sprockets, for sawing through sand with the rear sprocket as our axles scrape a level, like "striking measure" on a peck of oats, does not improve lubrication, and it argues for the shaft drive.

We cross North River, skirt the north end of the Short mountain, and run over fair roads through the famous Hampshire county, W. Va., peach belt, from which we get every year a groundless rumor that the frost has ruined all prospect of a crop. Now, however, hundreds of acres of blackened stumps bear witness to the ravages of a fungous parasitic disease which threatens the ruin of the peach trees of the entire region. The grower sees the leaves in his orchard turn yellow as his trees sicken and die. We pass through Augusta and skirting north of South Branch Mountain we coast down into Romney, W. Va., on the south branch of the Potomac river, the center of a bass fishing district.

Once more saying "Get thee behind me" to the fishing impulse, we crossed the south branch, skirted it for a mile and then, still following the northwestern turnpike, we pass through the beautiful Mill Creek gap in the mountains. Here we were astonished to see a beaver scamper up the bank and disappear in the bushes. Getting out we saw a beaver "slide," but no attempt at dam building. At the ford where the pike crosses Mill creek about a mile from the Potomac, a fork to the right, not fording, leads up over the mountain, cutting off three miles on the run to Romney, but the rough, rocky road and steep ascent are not inviting, so we take the ford, and follow the pike four miles farther, where we make a right turn, and a mile farther on a second right turn into the Patterson creek pike, which is a good smooth slate road, rolling and curving to Headsville, where another right turn takes us into the same kind of a road to Frankford, W. Va., 66 miles from Winchester. Here we turn left into the Cumberland road, which is excellent except the last two miles approaching Cumberland along the mountain side above the Potomac, which are rough and sandy.



VALLEY PIKE NEAR STAUNTON IS A SAMPLE OF VIRGINIA ROADS.

All these West Virginia roads, after leaving the Northwestern turnpike near Moorefield junction, are narrow, and it is advisable to toot the horn (chimes and gabriels would not be recognized as belonging to a vehicle) occasionally so that approaching teams can stop at a wide place for passing, and even then you will have to back up occasionally. Fortunately there are very few teams on the road except on Saturdays and Sundays.

It is a delight to leave a hot, smoky, black railroad town like Cumberland on a fiery hot day in July, and following Wills creek out through the Gap, roll along this good, smooth portion of the National pike eleven miles up the eastern slope of Big Savage mountain to Frostberg, which is 1,300 feet higher than Cumberland. From here the ascent to the summit is the worst piece of roadway on the entire Pike between Maryland and Indiana. Great boulders the size of a tub project above the surface, and between are sprinkled rounded rocks the size of a man's head. Smaller stones crunch, sputter and shoot out from under the pneumatics and bombard the mud-guards, which shake like stage thunder. Gradually we reach the summit, just over which is a delightful little spring of the coldest water. It seems odd so near the top of the mountain, but the springs are a feature of the Old Pike. They abound everywhere, and many are so large they start a mountain stream. They are welcome to those whose engines overheat, or who, like ourselves, regard mountain spring water the safest beverage for the automobilist. Many of the Maryland and West Virginia mountains are waterless, as are two of the mountains on the Pittsburg and Philadelphia pike east of Bedford. While the automobile is horseless, it is not yet generally waterless. A leak in the cooling system in those mountains may mean as long a walk as a leak in the gasoline system. Against the latter accident we carried three gallons in a box on the left hand step, so that after patching the leak with a bit of tubing or solder we should have some "juice" with which to proceed.

After a short coast we cross Big Savage river, a small stream with a big name, then climb and coast over Little Savage mountain, and after crossing a two-mile run we pass the Shades of Death, so called from the dark shade cast by the coniferous trees which once bordered the road, and which are now betokened by blackened stumps. After crossing Wolf swamp the ascent of Meadow mountain begins. On the summit is a lonely grave at the roadside, surrounded by a rough railing made of barked saplings. Here is buried an old tramp. By the papers found on his emaciated dead body, which the hogs were about to devour, it was learned that he had been a soldier in the Civil War. The faded flags and little iron star showed that a fellow veteran had not forgotten the lone grave on Memorial day. What monarch could have a grander grave than this on the summit of Meadow mountain, surrounded by ridge after ridge of green mountains, fading a paler and paler shade as far as the eye can reach.

The old pike is not without its tragedies. A house torn down on Keyser's ridge revealed a skeleton between a double wall. More than one cellar floor has given up its dead, and many a mysterious disappearance of man and money remains unexplained to this day.

After laying a few wild flowers on the old soldier's grave, we push on over Chestnut ridge, from which we have a fine view of Gransville. This is growing out of a pike town into a summer resort, and new buildings of a lower architecture than the old pike type are being erected.

Crossing Pussly Run, on Negro mountain, the desire to fish becomes irresistible, and we at last succumb. Putting up at a delightful stopping place on Keyser's Ridge, where food is good and linen clean, we spent one of the happiest afternoons on the trip. The local people say that when the pike "runs" with water in a rain, the streams are murky enough for good fishing. That's the way we found it, and we caught enough plump speckled trout for breakfast, not to mention the "mulligrubs" (a species of catfish), enough for the cats at the house. It was delightful crawling through the rhododendrons in full bloom, the laurels and the gray lichen-covered rocks under the pine and hemlock trees, wading across the stream now and again over the moss-covered stones. It is not the heavy creel that makes up all of the delights of fishing.

As to our own mechanical troubles, we had none. Running short of cylinder oil in the mountains, we disconnected the multiple feed from everything except the cylinder, so as to save our oil for that alone. Then we put oil cups from an agricultural implement agency on the robbed bearings, so that common oil from the same agency could be used. Besides this, we lost a hub cap, but a baking-powder can, pushed on hard, kept the dust out just as well.

Did we have ignition troubles? No. We put in two sets of new batteries before we started, rewired everything with the best cable we could procure, and put in lots of "pig tails," so that no pull could come on the wires in the straining and twisting of the frame over the rough roads and water breakers.

Leaks in our tubing? Not at all. We put on a new outfit of steam tubing, with plenty of slack, to serve the same as "pig tails." Tire troubles? None. We started with a new outfit, keeping our old ones for service in the city, where the tire man is handy. We do not propose to turn ourselves into a roadside repair shop if we can help it. We would take some other kind of a vacation first. Much-cut shoes were changed before morning starts, lest they should blow out on the road.

One incident reminded us of the Scotchman who, when asked if he had a light, replied: "Aye, but it's oot." We were run into from the rear by an Irishman in a cart. We asked him if he could see a red light, or was he blind. He said: "Shure, if youse 'ud putt a wee tech o' a match to the wick." The oil cup had shaken out and was lost. After that we used a candle in a hole in a piece of board wired on.

Keyser's Ridge is of 2,880 feet elevation, and the study of the cloud effects during a storm was very interesting to a lowlander. Sitting on the second-story veranda, clouds could be seen rising and falling, forming and dissolving between us and the surrounding ridges. From Keyser's Ridge a fair mountain road leads south to Oakland, Md. (25 miles), Keyser, W. Va. (48 miles), whence the northwestern turnpike leads through Romney, W. Va., to Winchester, Va.; or, by leaving the northwestern pike near Moorefield Junction, and taking the Patterson Creek pike, a good road leads to Cumberland, Md. Oakland is a justly celebrated summer resort, and this road south from Keyser's Ridge is the best way of reaching it by way of the National Highway.

Returning from fishing after the shower, we had noticed cloudy masses of mist rising like white smoke from between the ridges. The local people told us this was a sign of more rain. "Whatever goes up must come down," they said. It came down, and it was no mist coming down. The pike was "running" in ten minutes. But it dries quickly, and, after a good sleep, with the cool mountain air blowing in at the window, and a good breakfast in the morning, we pushed on to Chalk Hill, where we had a good dinner, and wandered over the mountains around Braddock's grave, Washington's spring, and Jumonville's grave, where the first shot was fired in the French and Indian war.

We coasted down the western slope of Laurel Ridge six miles to Uniontown. From here, through Brownsville to Beallsville, where we left the Old Pike, the road is good. Thence into Pittsburg the run was uneventful, and our thousand-mile tour was ended.

The backers of the proposed trolley line from Lyons to Sodus Point, N. Y., have decided on a plan whereby they can carry passengers over the route without the right of way. They have rented a number of automobiles and will use these. Three cars of the pattern of the "seeing New York" style have been placed in operation and will continue to run until October.

CLUBS PREPARING FOR THE FALL SEASON

Rochester Autoists Enraged at Unlawful Arrests.

ROCHESTER, N. Y., August 20.—Several A. A. A. members, who were arrested in the town of Lima at the time the A. A. A. tour was passing through that place, have complained bitterly of the alleged illegal action, and threaten to bring suit against the town. It is claimed that fines were collected at the roadside without trial. F. Edward Spencer, of the New York Motor Club, has written a letter to George D. Wilcox, a member of the Rochester Automobile Club, describing the procedure of the Lima authorities on July 12. The local club is interested, and may aid in the threatened action. John J. McInerney has been engaged by several to look after their interests in the intended suits. Commenting editorially on the matter, the Rochester *Democrat and Chronicle* says:

"The usual offenders in these controversies are reckless and irresponsible drivers of automobiles; but in the Lima affair, according to the account of the tourists, every reasonable effort was made to comply with the village ordinance. The apparent usurpation of judicial authority by a constable or police official to the extent of exacting an exorbitant fine on the highway is also a matter that will probably have to be explained in court.

"The public and local officials should understand that there are rights, as well as obligations, on both sides of this matter. The rights of automobilists are just as clearly and vigorously defined in the laws of this state as those of city or village corporations."

The outing given the orphans by the Rochester Automobile Club recently made such a favorable impression on the public that the suggestion has been made through the columns of the local papers that the club now give an outing to the inmates of the Homes for the Aged.

Gliddenite Flinn Will Make Another Long Tour.

PITTSBURG, PA., August 20.—Philip S. Flinn, of the Automobile Club of Pittsburg, winner of a perfect score in the Glidden trophy contest, will start for Chicago and the Northwest the last week of August, with his wife and a party of friends. The distance expected to be covered will be greater than the mileage of the A. A. A. tour.

New Jersey A. and M. C. Race Meet Program.

NEWARK, N. J., August 20.—Eight events are on the program for the Fourth Race Meet of the New Jersey Automobile and Motor Club, which will be held at Weequahic Park, Waverly, N. J., Labor Day, September 3. Included in the eight events scheduled is a club handicap, a pursuit race, a free-for-all, and a 25-mile handicap.

The entry blanks state that the races will be for stock cars only, with the exception of the second and sixth events, and that the prizes will consist of silver cups and gold medals. The first event scheduled is a 25-mile handicap for cars costing from $750 to $4,000, and all cars entering this event must be regularly equipped with the exceptioi of lamps and mud-guards. A 5-mile handicap for single cylinder cars will follow, to which cars costing not more than $1,000 and having from eight to twelve horsepower will be eligible. The third event will be a 5-mile race for cars costing from $750 to $1,500. Then will follow a 5-mile handicap for club members only, the first prize being a silver cup donated by the club's president, Joseph H. Wood. In this event the cars must be regularly equipped, with lamps and mud-guards. The fifth event will be for cars costing from $1,600 to $2,000, and will also be a 5-mile contest. In the next event, the 10-mile free-for-all, which is the sixth on the program, there will of course be no restriction as to the equipment. The pursuit race, which will be one of the special features of the meet, will follow. Each car, when overtaken by another, will drop out of the race, until only two remain. One of the two remaining cars must overtake the other, but in case this is not accomplished within a distance of five miles, the one making the best time will be declared the winner. The last race on the program will be the club handicap. Two special events are being arranged for by the committee that will be of particular interest. These may be exhibition events by Barney Oldfield, with his Peerless racer, and Maurice Bernin, of Renault fame. The track will be open on Thursday, August 30, for the purpose of trying out the entered cars. Entries will close with Secre-

ORPHAN'S DAY AT ROCHESTER, N. Y. AFTER THE CARS EMPTIED THEIR SMALL OCCUPANTS ON SENECA PARK MEADOWS.

tary H. A. Bonnell, 1034 Broad street, Newark, N. J., Wednesday, August 29. The races are scheduled to begin at half past one o'clock.

There is seemingly a popular demand for automobile racing in Newark, which is borne out by the fact that at previous race meets there has been an attendance of over 20,000 people. A rumor has been current during the last few weeks to the effect that a scheme is under way by several automobile promoters who are desirous of building a mile track in New Jersey for the exclusive use of automobilists. Many of the local motorists have signified their willingness to advance $1,000 each to further this scheme. The matter was brought to the attention of the members of the New Jersey Automobile and Motor Club at a recent meeting by President Wood, of the club, in which he spoke of the need of such an enterprise. The old Linden racetrack was mentioned as one of the spots for the proposed new track, and it was said that the property was for sale. It is situated near Elizabeth, N. J. Those who are promoting the scheme intimated that it would cost about $50,000 to put the old track in shape for racing.

Prominent Worcester Club Men Escape Fines.

WORCESTER, MASS., August 20.—Expert testimony in regard to what might be termed reasonable speed over a quarter-mile course with one house, no trees along the highway and no carriages on the road, played an important part in the trials here of Frederick E. Frost, secretary of the Worcester Automobile Club, and William H. Dexter, both arrested for violating the automobile laws in Paxton, by Constable W. H. Pike, a couple of automobile traps having been established in that town. For the first time this year the defendants in such cases escaped without a fine. Their cases were placed on file, which means that there is no record of a conviction against them with the State Highway Commissioners. They were found technically guilty, however, and Judge Hollis W. Cobb's rulings have again occasioned considerable comment. Automobilists are wont to term the brand of justice which is handed out to them here as "queer."

Constable Pike testified that he had only one good eye, but he knew the cars were exceeding the speed laws. Quinn, of Leicester, was in court, and Attorney D. F. Gray, of the Worcester Automobile Club, who appeared for the defendants, called him as a witness to offer evidence as to the speed of cars. Quinn's testimony was of such a character that it did not hurt the government. Neither did it help Mr. Gay's clients.

Kansas City Automobile Club's Endurance Run, Sept. 15.

KANSAS CITY, MO., August 20.—September 15 has been selected as the date for the 100-mile Endurance Run of the Kansas City Automobile Club. The course has yet to be selected, but uniformly good roads will be possible. The A. A. A. rules for the Glidden trophy will be utilized with various necessary modifications. The club intends to hold a race meet at Elm Ridge early in the fall. The opening of the Cliff Drive to automobilists will be observed by the club, which will arrange a parade of all automobilists in the city.

The club celebrated the opening of the new Cliff drive by a run Wednesday, August 15. This drive is a part of the park system, and has heretofore been closed to automobilists. At the request of the club, one day a week—Wednesday—automobiles will be allowed to use the drive, the Park Commissioners taking this action at their last meeting.

Colonel E. H. R. Green a Texas Candidate for Governor.

DALLAS, TEX., August 20.—Col. E. H. R. Green, who is one of the most prominent members of the Dallas Automobile Club and is a member of the A. A. A. Racing Board, has been nominated by the Republicans as a candidate for the Governorship. The whole-souled Colonel will poll the entire vote of the automobilists of Texas, but unfortunately they are almost as scarce as the Independent Republicans who have nominated the Colonel.

THE AUTOMOBILE CALENDAR.

AMERICAN.

Shows.

Sept. 22-29.....—First National Automobile Parts Show, First Regiment Armory, Chicago; A. M. Andrews, Secretary, 184 La Salle street, Chicago.

Dec. 1-8.....—Seventh Annual Automobile Show of the Automobile Club of America, Grand Central Palace, New York City, under the patronage of the American Motor Car Manufacturers' Association.

Jan. 12-19.....—Annual Automobile Show of the Association of Licensed Automobile Manufacturers, Madison Square Garden, New York City.

Tours.

Aug. 25.....—Annual Automobile Day and Parade of the Duluth Automobile Club, Duluth, Minn.

Aug. 29.-31.....—Three Day Economy Run, New York Motor Club.

Aug.....—Annual Gymkhana Games of the Worcester Automobile Club at North Grafton, Mass. (Date to be announced.)

Sept.....—500-mile Endurance Test, Grand Rapids (Mich.) Automobile Club. (Date to be announced later.)

Sept.....—200-mile Road Race, for the Farson Cup, Chicago Automobile Club. (Date and course to be announced.)

Oct. 1-2.....—St. Louis, Mo., Automobile Parade and Carnival, St. Louis Automobile Club.

Oct. 20.....—Philadelphia, Pa., Cross Country Run of the Philadelphia Automobile Club.

Race Meets and Hill Climbs.

Aug. 24-25.....—Empire City Track, New York, Race Meet, under management of W. H. Pickens.

Sept. 3.....—Race Meet, New Jersey Automobile and Motor Club, Weequahic Park, Waverley, N. J.

Sept. 3.....—Topeka, Kan., Race Meet of Topeka Motor Car League.

Sept. 3.....—St. Louis Fair Association Track Races. Entries close August 25 with J. H. Phillips, Manager, 2933 Olive street, St. Louis.

Sept. 6.....—Hill Climb, Algonquin, Ill., Chicago Automobile Trade Association.

Sept. 22.....—American Elimination Trials for Vanderbilt Cup Race. (Long Island Course probably.)

Oct. 6.....—Vanderbilt Cup Race, American Automobile Association.

Motor Boat Races.

Aug. 21-23.....—Gold Challenge Cup, American Power Boat Association, on St. Lawrence River at Chippewa Bay.

Sept. 10-15.....—National Motor Boat Carnival, Hudson River, New York City. Under the auspices of the Motor Boat Club of America.

FOREIGN.

Sept. 1-8.....—Canada International Exhibition, St. John, New Brunswick.

Oct. 5-14.....—Leipzig (Germany) Exhibition, Kyrstall Palast.

Nov. 1.....—New Zealand International Exhibition opens at Christchurch.

Nov. 1-16.....—Berlin (Germany) Automobile Exhibition.

Nov. 15-24.....—London, Olympia Motor Show.

Nov. 23-Dec. 1.—London Stanley Show, Agricultural Hall.

Dec. 7-23.....—Paris, Ninth Annual Salon d'Automobiles, Grand Palais.

Dec. 15.....—Calcutta, India, Exhibition of Automobiles, etc., Automobile Association of Bengal.

Races, Hill-Climbs, etc.

Aug. 23.....—Semmering Hill Climb.

Aug. 27-Sept. 2.—Brescia (Italy) Automobile Meeting.

Sept. 3.....—Auvergne Cup Race, France.

Sept. 9-20.....—Pallenza (Italy) Automobile Meet.

Sept. 27.....—Tourist Trophy Race, Isle of Man, A. C. of Great Britain.

Oct. 7.....—Chateau Thierry (France) Hill Climb.

Oct. 23.....—Gaillon (France) Hill Climb.

Oct. 30.....—Start from Paris of the Gordon-Bennett Aeronautical Cup Race.

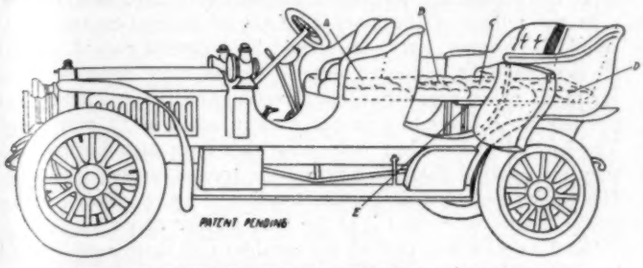
Motor Boat Races.

Aug. 20-23.....—Ostend (Belgium) Motor Boat Races. Dover to Ostend.

Sept. 16.....—Juvisy (France) Motor Boat Meeting.

FOR AMBULANCE OR SLEEPING SERVICE.

A device which will enable the owner of a car to which it is applied to convert his automobile into an ambulance or a sleeping-place for the night has been invented by Charles C. James, of St. Louis, Mo., and is illustrated in the accompanying drawing. The idea is to drop the back of the left front seat until it is in a horizontal position, to push forward the seat cushion of the left rear seat until it meets the back of the front seat, and to bring down the back of the left rear seat until it lies horizontally on the seat in place of the regular seat cushion which has been slid forward. In the drawing *A* is the cushion of the left front



CONVERTIBLE SEATS THAT TRANSFORM A CAR'S INTERIOR.

seat; *B* is the back of the same seat dropped down; *C* is the cushion of the left rear seat which slides forward on a special frame *E*, and *D* is the back of the left rear seat, dropped into a horizontal position.

In the case of a car used as an ambulance, a small rear door would be provided, through which a cot or stretcher could be passed without difficulty.

ADVISES AMERICAN FIRMS TO EXHIBIT.

Vice-Consul A. D. Piatt, through the U. S. Consular Reports, calls attention to the fact that the Irish Automobile Club will hold a Show at Ballsbridge, Dublin, January 5 to 12, 1907. These suggestions are also made:

"All applications for information and space should be made to Walter Cawood, St. James Hall, Manchester, England, who has charge of the undertaking. As this show will be open to all manufacturers of motor cars and motor accessories, it will be a good opportunity for American manufacturers to introduce their cars to the Irish market. At present a few makers seem to do almost the whole of the automobile business. The few American cars to be seen on the roads in Ireland, such as the White steam car, the Cadillac, and Winton, have a good reputation. Motor manufacturers who wish to cultivate the Irish market will find it to their advantage to exhibit their cars at the coming show. They should also arrange to have Irish representatives, and not depend entirely on a central firm in London to look after their interests in the United Kingdom. Indeed, if several American firms opened a joint house in Dublin they would soon find it profitable, if only well-made and durable cars were sold."

THE CAR STOOD THE HARD TRIP.

TACOMA, WASH., Aug. 20.—A rather notable automobile feat was accomplished last week by Peter Sandberg, who in a Columbia crossed the Mashell mountain, which lies in the foothills of Mount Tacoma. This is the first time that an automobile has made this trip. In building the new road to Mount Tacoma, this mountain is overcome by the selection of another route. But it is the only way now. Mr. Sandberg made the trip to call on W. P. Reynolds, who is camping at Mineral Lake. The road over the mountain is a corduroy, and it has not been supposed that a car could ever stand the jostling that a trip over this means. At Mineral Lake the car attracted considerable attention, being the first one ever through that far. Mineral is 54 miles from Tacoma. With the exception of the road over Mashell, the roads are in good condiion, which shows that in completing it there will only be occasional geological obstacles to overcome.

ALGERIAN DEMAND FOR LIGHT, CHEAP CARS.

It is the belief of Consul James Johnston, at Algiers, that few countries employ as many automobiles as Algeria in proportion to their population, and after careful inquiry on the subject he is inclined to think that America might secure a fair, if not a large share of the trade in light and low-priced cars, for which the demand appears likely to continue and increase. The consul continues:

For the more expensive cars the supply seems to more than keep step with the demand, and competition with the French makes would be difficult. What is wanted is a light two-seated car, and a good hill climber, for level ground is the exception here. But no business, as far as I can see, can be done in Algeria without having sample cars on the spot. People will not buy before seeing the goods. It would therefore be desirable to make arrangements with a good local agent, and before doing so it would be prudent to send out a capable man, speaking French, to make himself acquainted with the wants of the country, and with the standing and intelligence of the agents and merchants. It is quite useless to try to do a trade by sending descriptive matter in English, and quoting prices in dollars at the factory.

Up to the present the French manufacturers do not appear very willing to undertake this class of business, but a serious competition may be expected from Italy. An Italian motor can be sold retail in Algiers at less than $500, freight, duty and agent's comission all included. The duty is about $120 per ton of 2,240 pounds. [The principal dealers and agents in the city of Algiers are given by the consul, and will be furnished to applicants by the Bureau of Manufacturers.]

WASHINGTON PREPARES FOR FREE ALCOHOL.

TACOMA, WASH., August 20.—Anticipating that denaturized alcohol will offer unusual opportunities, time is being taken by the forelock on Puget Sound by the incorporation of the Buckley Fruit Growers' Association, with a capital stock of $5,000. The articles provide, among other things, that denaturized alcohol is to be manufactured, and this is the first effort in this direction in this section of the country.

Gasoline is now used for many purposes on the Pacific coast There are an abundance of motor launches on the coast, and together with the growing automobile class, the field should prove an exceedingly fruitful one, once it is demonstrated that the alcohol will do the work of the Standard Oil Company product. The incorporators of the company are all residents of Buckley: John B. Frost, John A. Hamilton, E. M. Mittan, Charles Wilson, and C. C. Whitmore.

MITCHELL FORDING A STREAM IN SOUTHERN CALIFORNIA.

An incident in the recent trip of President Lewis and Mr. Mitchell of the Mitchell Motor Car Company, of Racine, Wis., from San Francisco to Los Angeles.

THE AUTOMOBILE

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Is New Jersey Finding Its Law Unprofitable? Now comes the information that the State Commissioner of Motor Vehicles of New Jersey is somewhat exercised over the fact that only $100 thus far has been turned in to the State from the former prolific channel through which fine money from automobilists flowed copiously. According to a Newark paper, the Commissioner is taking steps to keep tabs on justices of the peace and other magistrates who have been collecting fines under the new law. Incidentally, it is stated that there is a growing belief "that a system of graft has sprung up as the result of the new crusade against the horseless-vehicle drivers."

Despite the apparent press agent work, telling of the excellent results of the New Jersey law, there is a very pronounced impression that the next Legislature of that State will revise, in a greater or less degree, the present statute, the revenue from which has been vastly under what was obtainable under the preceding law.

Wherein the New Jersey law is weak—like the laws of other states, nevertheless—is in permitting the annoying arrests of those automobilists who exceed unwittingly by the smallest fraction the stipulated varied speeds at times when no danger whatever exists to other users of the road. The intent of the law is not expressed in these unfair arrests, but the only way to end such persecution is by abolishing all speed limits, a plan suggested by the British Motor Commission. Country traps are not cures for bad automobiling.

A just answer to the New Jersey requirement that all automobilists from other states must obtain New Jersey licenses would be a similar clause in the laws of these other states referring particularly to New Jersey automobilists. Then the Jerseymen would endeavor to convince their own legislators that there was such a thing as reciprocity in these United States.

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Telling the Story of an Endurance Run. Endurance runs, fuel tests, and other forms of reliability trials unquestionably interest in vast degree the automobile-buying public. While many are well satisfied with the present ability of the automobile, there are thousands of others yet to be influenced and their attention attracted to the motor-driven vehicle by these more generally valuable substitutes for high-speed contests.

In the telling of the story all facts of interest to the public should be printed, but there should be a careful record, so that all cars shall be subjected exactly to the same scrutiny. One car might prove superior in one direction and fail in another, and possibly no car would preserve a clean score in all particulars. The leading makers fear little from this form of publicity when they are assured that all cars will be treated to like inspection. If a weak point exists in the construction of his car, the far-seeing maker desires to correct it at the very earliest opportunity.

But THE AUTOMOBILE does not consider that these events should be covered in a hit-and-miss manner in the way of endeavoring to compile and exploit hastily obtained roadside information as to the mechanical troubles of the contestants. Finding one car in distress, and unavoidably missing others with similar or even greater ills, does not supply a proof of the editorial independence of a paper. This haphazard form of reporting is unfair to the participants of a contest, and likewise misleading to those who read such incomplete reports.

The fault can be remedied easily by an official inspection, which shall include every contestant, and then no concern can feel that its product has undergone any test of criticism to which all others have not been similarly treated.

✷

Contest Between Four Cylinders and Six. In an interesting English trial held recently to determine the relative merits of the four-cylinder and the six-cylinder touring car the latter officially won. An analysis of the performances, however, shows that the result was really a "stand off." The rival cars were a four-cylinder Martini and a six-cylinder Rolls-Royce, and the contest was held under the auspices of the British Automobile Club. The qualities for which marks were awarded were: hill climbing, speed on a track, changing gears, fuel consumption, silence and absence of vibration. At the conclusion of the contest the score stood 2,277 for the Rolls-Royce and 1,881 for the Martini, though had not the four-cylinder suffered a loss of 385 marks for "reliability" due to the temporary stoppage of the fuel pressure feed pipe it would practically have tied the six-cylinder. A mishap of this sort is likely to happen to any car equipped with a pressure system and cannot have weight in any technical consideration of the relative merits of the cars.

A very thorough trial was arranged for the machines. They were driven from London to Glasgow, and subsequently took part in the Scottish reliability trials, returning afterward to London under their own power—a total distance covered of about 1,600 miles. Neither car had trouble from any cause attributable to the number of cylinders in the motor, and the performances in each special test were not very wide of the expected. In hill climbing, speed on a level track and fuel economy the four-cylinder car made the better showing, while in gear changing on hills, silence, absence of vibration and reliability the six-cylinder car came out ahead.

The Martini was rated at 30-40 horsepower and had cylinders 125 mm. bore and 140 mm. stroke, and the Rolls-Royce was listed 30 h.p. with cylinders 100 mm. bore and 127 mm. stroke.

Results of this competitive test leave the question of six cylinders vs. four cylinders very much where it was before, a question to be decided by the purchaser dependent upon what points of superiority he considers of greatest importance.

THE SEVENTH GARDEN SHOW.

Herewith is the announcement of the A. L. A. M. concerning its January show:

"The Seventh National Automobile Show at Madison Square Garden will be held January 12 to 19, 1907, under the auspices of the Association of Licensed Automobile Manufacturers. The 1907 show will differ radically in its beauty of form and color from all predecessors. It will have more automobiles, more exhibitors, a greater floor space, and many other new features that will increase the comfort, pleasure, and satisfaction of visitors, as well as assure success to the exhibitors and to the show itself.

"The 1906 show in the Garden—the most successful ever held—attracted thousands of visitors by its marvelous beauty and held them irresistibly; moreover, the exhibits were displayed to advantage by the rich simplicity and appropriateness of the decorations. Never before was so much business done by exhibitors, nor with such facility; never before was a show so quickly installed, and promptly opened; never was one so comfortably conducted, and never was there one so easily and rapidly dissembled. There was more money expended in the preparation, decoration and management of the 1906 show than of any other, yet the cost to individual exhibitors was less.

"Even before the closing of the 1906 show, it was very evident that the demand for 1907 show space would be enormous, and it is gratifying to announce that by executing the show management's plans, which have been perfected and approved by competent engineers, the exhibition space will be increased by about 8,000 square feet.

"To provide for the most attractive, suitable and artistic decorations, the show management sent its official decorator to Paris London and other places abroad to study details of decoration for embodiment in his general plan. The evidences of this visit will be apparent in the general result, but the main object of the show—the exhibition of automobiles and their parts and accessories—will be of prime consideration and final consequence.

"On the main floor and elevated platform will be shown gasoline pleasure vehicles. In the exhibition hall, Madison avenue front, will be electric pleasure vehicles. In the basement will be commercial vehicles. On the mezanine platform, balcony, and in the concert hall will be complete exhibits of tires, parts, and accessories. The management will again take charge of all the decorating, of placing the exhibits in the various spaces, and will attend to the general care and policing of the show."

A. M. C. M. A. MANAGER REEVES RETURNS

Manager Alfred Reeves, of the American Motor Car Manufacturers' Association, has returned to New York from his western trip, and reports trade conditions excellent in every center that he visited. The idea of an early show has found favor with all the members of the association, and numerous additions to the association's membership are predicted as a result of Mr. Reeves' trip. "Everywhere in the West," says Mr. Reeves in an interview with a representative of THE AUTOMOBILE, "I found approval of the early show innovation of the association, and the enthusiasm of the makers gives me the greatest confidence in the outcome of the venture."

ATLANTIC CITY TO HAVE A RACE MEET.

Atlantic City, N. J., is to have another big meet. It will start on Labor Day, Monday, September 3, and be continued on Tuesday and Wednesday. It is announced that stock car competitions will figure as prominently as they did at the successful spring meet. Harry B. Cook, chairman of the Atlantic City Automobile Club's racing committee, has opened New York headquarters at room 304, 29 West Forty-second street. He can also be addressed at the Seaside Hotel, Atlantic City. Entries of the celebrated driver are expected and every effort will be made to have the meet exceed in interest last spring's event.

BOSTON LAW ENFORCEMENT.

BOSTON, August 20.—Police Commissioner Stephen O'Meara, of this city, is preparing for a campaign against the law-breaking automobilists, and as a preliminary has provided the officers and patrolmen with 1,500 pamphlets containing the laws of the state relating to automobiles and the rules and regulations of the Highway Commission. He has also issued an order, which has been placed in the hands of every officer and patrolman, calling their attention to the manner in which they should enforce the law. Unlike the police authorities in some of the smaller places, Commissioner O'Meara does not believe in wholesale arrests for every infraction of the law; at least not until the policeman and the automobile drivers have had ample time to familiarize themselves with the laws and the rules. His plan is to warn offenders in most cases, and if the warning is not heeded, then to enforce the letter of the law. His attitude is shown in the following extract from his order:

"There will be no general movement, therefore, to catch and to punish all offenders, regardless of their intent or of the character of the offences. The reckless driver, the drunken driver, the driver who imperils the lives and property of others, will be dealt with by the police with all rigor that the law permits. But in other directions the police will watch, warn and inform owners, dealers and drivers, with the purpose of entering a little later upon a firm, sensible, thorough enforcement of all provisions."

He further orders the policemen to secure the observance of the law relating to the display of numbers and lamps by warning the offenders. The police are not to stop machines to inspect licenses, but if machines are stopped for another purpose the policeman is to ask for the license and certificate of registration. If a machine whose driver has been warned does not profit by the warning, his action is likely to be construed as a deliberate violation of the law. The commissioner calls special attention to the rules of the road governing the passing of vehicles, and says the policeman must not forget that these rules apply to all vehicles.

THE A. A. A. HIGHWAYS COMMITTEE.

The Highways Committee of the American Automobile Association includes a list of well-known workers for roads improvement. Herewith is the complete list of the committee:

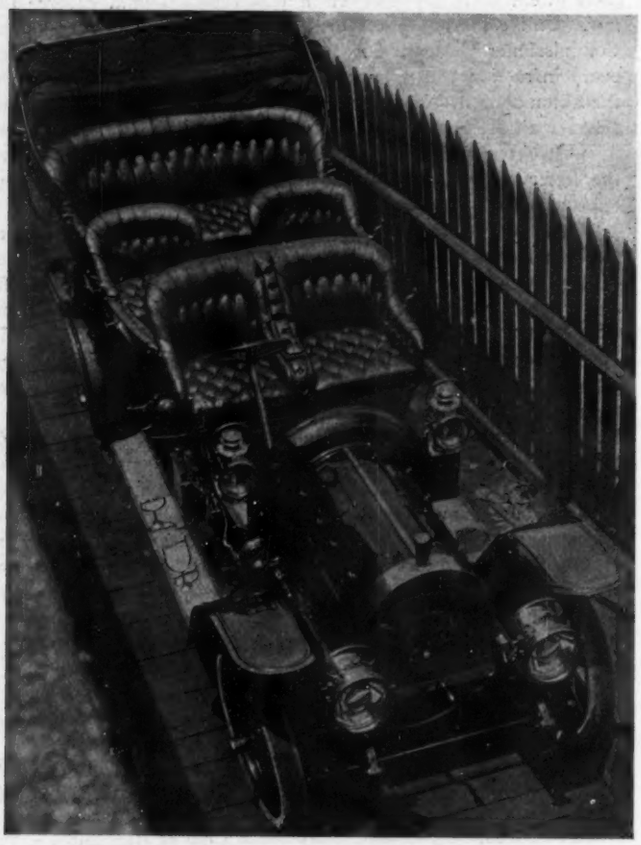
Robert P. Hooper, chairman, Automobile Club of Germantown, Pa.
W. H. Chase, Wachusetts (Mass.) Automobile Club.
Wm. T. White, Mercer County Automobile Club, Trenton, N. J.
N. H. Kilmer, Monmouth Automobile Club, Asbury Park, N. J.
J. H. Wood, New Jersey Automobile and Motor Club, Newark, N. J.
H. E. Taylor, Kankakee (Ill.) Automobile Club.
R. A. Whitney, Peoria (Ill.) Automobile Club.
A. E. De Mange, Bloomington (Ill.) Automobile Club.
A. R. Shattuck, Automobile Club of America.
F. A. Burrelle, New York Motor Club.
Daniel P. Ray, Cattaraugus Co. (N. Y.) Automobile Club.
Chas. Jerome Edwards, Long Island Automobile Club, Brooklyn.
Augustus Post, Long Island Automobile Club, Brooklyn, N. Y.
B. B. Taggart, Watertown (N. Y.) Automobile Club.
H. L. Hoyt, Automobile Club of Auburn, N. Y.
John M. Satterfield, Automobile Club of Buffalo.
L. G. DeCant, Watertown (N. Y.) Automobile Club.
Henry G. Strong, Rochester (N. Y.) Automobile Club.
C. Gordon Neff, Automobile Club of Cincinnati.
Roy F. Britton, Automobile Club of St. Louis.
Dr. Perry Schurtz, Grand Rapids (Mich.) Automobile Club.
Everitte K. Barnes, Rockford (Ill.) Automobile Club.
W. L. Colt, Cleveland Automobile Club.
D. Clinton Slagle, Automobile Club of Maryland, Baltimore.
W. R. B. Whitier, Automobile Club of Maryland, Baltimore.

ANOTHER FACTORY FOR JACKSON, MICH.

JACKSON, MICH., August 20.—Articles of incorporation have been filed by the Steel Swallow Auto Company, which has been organized here with a capital of $100,000, to manufacture an automobile and motor under patents secured by David Deering. The stockholders include, besides Mr. Deering, J. C. Richardson, Louis F. Boos, William E. Bellows, and Lee Alderdyce.

A CAR WITH BIG CARRYING CAPACITY.

Ample carrying capacity appears to be the special characteristic of the Royal Tourist, shown in the illustration, which is an unusual and distinctive one. The car was recently furnished by the Royal Motor Car Company, of Cleveland, to a customer in Missouri, who has a large ranch located about forty miles from the nearest railway station. The car will be used over very rough roads at all seasons of the year for transportation between the



ROYAL TOURIST WITH EXTRA SEATING CAPACITY.

ranch and the railway, and for carrying a larger number of passengers than are usually loaded into an automobile.

As will be noted by reference to the picture, ample seating capacity has been worked out for the above described purpose. This particular car has a wheelbase of 120 inches and is equipped with a conventional Royal motor of 45 horsepower.

BLOMSTROM COMPANY MAY BE REORGANIZED.

DETROIT, MICH., Aug. 20.—The difficulties under which the C. H. Blomstrom Motor Company has been laboring for some time bid fair to be cleared away if the petition filed in the circuit court is heeded. Some time ago an application was made at Lansing by the attorney-general of Michigan to have the privilege of the C. H. Blomstrom Motor Company to do business in that state taken away, it being charged that it was not properly incorporated. This action was taken at the instance of Carl H. Blomstrom, an injunction being issued.

Now Nathan M. Kaufman and Samuel R. Kaufman, two of the incorporators, have petitioned that the injunction be modified so that the company can hold a meeting and remedy the defects in the incorporation. The present indebtedness of the company, organized in 1904, according to the petition, is $300,000. In February last, at a meeting of the stockholders, the capital stock was increased by $100,000, of which $75,000 was to be paid for real estate in Detroit. The petitioners ask that they be allowed to call a business meeting of the stockholders.

PREMIER'S INTERCHANGEABLE COOLING.

INDIANAPOLIS, IND., Aug. 20.—In the completion of the first of its 1907 models the Premier Motor Manufacturing Company makes a radical departure from its recent practice of building only air-cooled cars by putting out a car with interchangeable cylinders, allowing either air or water cooling to be used in the same motors. All the Premier cars will hereafter be made on this plan. Though the Premier Company exhibited water-cooled cars, as well as air-cooled, at the Chicago show of 1904, it has since confined itself to the air-cooled type, with which it has become closely identified.

The announcement is more surprising in view of the fact that it has not previously been known outside of the factory that the company was even experimenting with a water-cooled motor. Preparations are now being made to make all cooling systems on all models interchangeable. This change, it is said, was taken only after the most careful consideration. The air-cooled motors, it is claimed, have been efficient and the change has been made largely with the idea of broadening the Premier field, entering that which has been held exclusively by the water-cooled motors in the past.

In general construction and appearance the interchangeable model is very much like the air-cooled model apparently. The body of the new car is practically unchanged from that of this season's model, although certain improvements add to the beauty of the car. The interchangeable model has a wheelbase about 2 1-2 inches longer than the Model L, which has been a leading feature of this year's Premier line.

In evolving a motor that can be changed from water to air-cooled, the company has tried to preserve as many of the salient features of the old cars as possible. The intake and exhaust are identical, as are the rods and pistons. New cylinders are required, but they are fitted with the same valves, the rods being shorter. A radiator and circulating system are also required in changing from air-cooled to water-cooled. The motor remains much the same, being the regular Premier type 24-horsepower motor used on the Model L Premier of this season.

An interesting feature is that with the water-cooled system the weight is only about seventy pounds greater than with the air-cooled motor. There is some change in the finish and upholstering, red or dark green upholstering being made optional.

In addition to the new touring car, the company is completing a two-ton truck, which is also to have the interchangeable cooling system. This truck is to have an overload capacity of more than 1,000 pounds. Two Indianapolis breweries are already considering the adoption of the new truck, but it is announced by the company that none will be sold until spring, after an exacting test has been made. The body, of platform design, will be made to suit the needs of the purchaser, although the standard will be a platform about 120 inches long by 70 inches wide. The wheelbase is 120 inches. The motor will be the 24-horsepower Premier motor, the same as used on the Premier touring cars.

Axles will be solid and the chassis will be equipped with semi-elliptic springs in the front and platform springs in the rear. Solid rubber tires will be used, those in front being 32 by 3 inches and those in the rear 32 by 4 inches. The gasoline tank will hold ten gallons. A speed of about 11 miles an hour will be the maximum.

The Premier Motor Manufacturing Company is looking forward to an active season in 1907 and will probably take steps to enlarge its already big factory. Further experiments are being made which will include the use of aluminum to a large extent in 1907 models.

WOLVERINE WORKS' REMOVAL TO BRIDGEPORT.

GRAND RAPIDS, MICH., Aug. 20.—The Wolverine Motor Works, of this city, will remove to Bridgeport, Conn., in the near future, possibly before January 1. The saving in freight rates and the large demand for the marine motors of the company in the East is the reason given for the removal. Added to these is the large demand for motors for motor boats in the East.

THE FRANKLIN FOR 1907 MAKES ITS DEBUT

CHANGES in the Franklin cars for 1907 are all in matters of detail, the main features of the 1906 cars being retained. Four models constitute the line, as follows: Type G, four-cylinder 12-horsepower touring car, for four passengers; Type D, four-cylinder 20-horsepower touring car, for five passengers; Type H, six-cylinder 30-horsepower touring car, for seven passengers, and Type G, four-cylinder runabout, for two passengers. All have three-speed sliding gear transmissions and propeller shaft and bevel gear drive and the laminated wood frames that are a feature of the Franklin machines. The runabout, Type G, is fitted with a body having a sloping rear deck and is adapted to take a large hamper for use in touring, or a detachable tonneau, giving a four-passenger capacity. Model D, the 20-horsepower four-cylinder, and Model H. the 30-horsepower six-cylinder, can be had with special landaulet or limousine bodies for town use. Tool lockers of convenient form are fitted; these are under the front seats and tip back into the tonneaus to open. When not held open they close automatically. There are also tool drawers of the ordinary kind under the front seat, and under the tonneau seat is a large receptacle for robes, rugs and the like. Brass handles and robe rails are also fitted. Front mud-guards are of the enclosed style used in the 1906 models, but their appearance has been improved by a more gradual slope made possible by the shortening of the running-board, due to the removal of the tool-box. Oilers are not attached to the dashes of any of the 1907 cars, removing the danger of getting oil on the clothes from a leaky or dirty oiler and giving the dash a neater appearance.

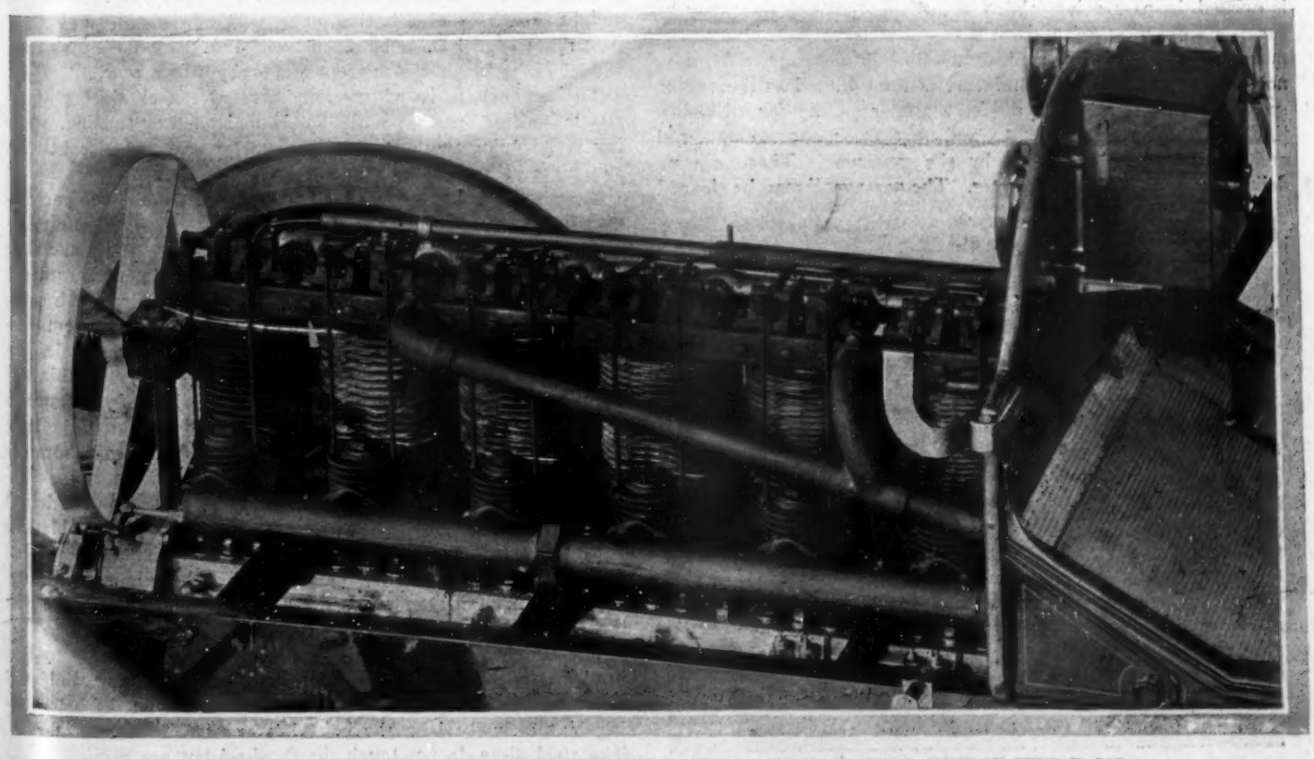
Royal blue is the standard body color throughout, with black upholstering of high-grade leather. Tonneau floors are covered with heavy carpet, which is easily removable for cleaning, and the toe-board and running-boards are covered with rubber matting. Tops are of a special design suggested by experience. Road clearance has been increased by the use of larger wheels than in previous models.

Control of the change-speed gears has been improved by the use of a new lever and latch arrangement, and the change from one speed to another has been made simple and certain. In making a change from the neutral position to intermediate or low, for instance, it is only necessary to grasp the lever and pull or push it, as the case may be, until it automatically catches in the proper position; the lever will not over-run. In changing from low speed to reverse, or from intermediate to high, the latch is used to release the lever and the lever pulled or pushed until it stops with the gears properly meshed. This makes a very simple arrangement that will appeal alike to the novice learning the use of the levers and to the more expert driver when he finds himself in a situation where a miss in changing gears would cause trouble. The latch handle is on the rear side of the lever and low down, where it will be out of the way when not wanted, and yet in an easily reached position for shifting to reverse or high speed. The change from high to intermediate is effected by a simple backward pull of the lever; the latch is raised to go into neutral position; a simple pull into low speed, and the latch is raised again to get the reverse.

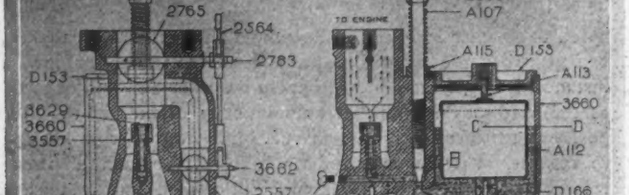
In the engines the changes are not numerous and affect only details. The auxiliary exhaust has been retained. With a view to securing silence in the running of the engine the contour of the cams has been modified, giving the valves a slower motion. The rocker arms through which the push-rods actuate the valves have been altered with regard to their pivots, giving a minimum movement and materially assisting in eliminating mechanical noises from the engine. Inlet piping is so made as to be non-leakable, thus obviating the possibility of diluting the mixture with air leaking in between the carbureter and the cylinders.

Lubrication of the engine is effected by a force-feed oiler placed close to the engine base under the hood and geared direct to the camshaft. This arrangement makes the operation of the oiler independent of belts and chains, and the heat of the engine keeps the oil thin enough to run freely, regardless of the outside temperature.

Carburation is accomplished by the same device as used in the 1906 cars, with additional refinements suggested by experience.



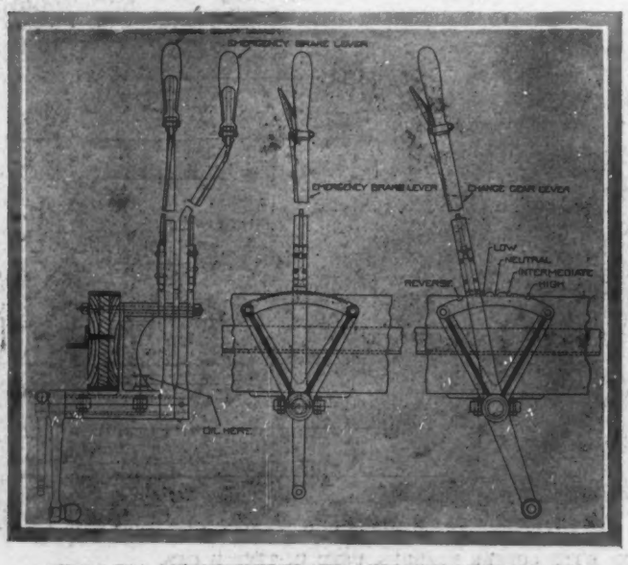
FRANKLIN 6-CYLINDER, 30-H.P. AIR-COOLED MOTOR WITH COPPER FLANGES, USED IN TYPE H CAR.



CARBURETER USED ON ALL FRANKLIN MOTORS.

The carbureter is illustrated by the sectional drawings. Gasoline enters float chamber *A* through passage *D*-171, passing through the wire gauze strainer *D*-169 and filling the float chamber to *C D*, when the float *A*-112 rises and closes the ball valve 2762, shutting off the supply of gasoline. When the gasoline level in the float chamber falls, the float falls and opens the valve, thus keeping the gasoline constantly at the correct height. The gasoline enters from below, and any sediment it may carry into the carbureter settles into the little cup *D*-167, which may be cleaned by removing cap *D*-153 and pulling out the float.

Air enters by passage *G*, suction lifting valve 2580, and passes by spray nozzle 3629 where it vaporizes the gasoline which comes by needle valve *B* and through passage *E* to nozzle 2786. Models *G* and *D* have a new three-spray nozzle, while Model *H* has six sprays. The amount of gasoline fed isregulated by needle valve *B*. The amount of air and vapor going to engine is controlled by throttle valve 2765, which is connected to governor. Throttle valve 2765 is also connected to by-pass valve 3661. When throttle valve is nearly shut so that engine will just run, by-pass valve 3661 is shut and all air must pass by nozzle 3629. As throttle valve is opened, by-pass valve is also opened, so that extra air may be furnished the mixture, and the more throttle valve is opened the more by-pass valve is opened, thus letting in more air which does not pass nozzle 3629. The mixture is thus diluted as the engine speeds up and is maintained of the proper quality for all conditions of running. Levers 2564 and 2567 are connected by a rod and act together, controlled by the governor. There are no delicate springs in this carbureter. The passage *E* may be cleaned by removing screw *H* and the nozzle 3629 may be cleaned by removing the suction pipe and putting a wire down into it through passage *I*.



LEVERS FOR EMERGENCY BRAKE AND CHANGE-SPEED GEAR.

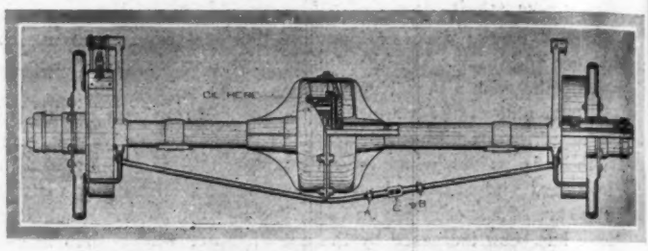
Spring *A*-107 serves to steady needle valve *B* and keeps it from unscrewing. Needle valve *B* is connected by universal joint *J* to stem with handle in front of dash, easily reached from seat.

Special attention has been given to making all working parts accessible. For instance, the hood can be raised like the lid of a box, exposing the entire engine; if greater freedom of operation about the engine is desired, the hood can be removed bodily without taking out bolts or screws. To examine the interior of the engine base, all that is necessary is to remove the supporting screws, thereby detaching the base plates and exposing to plain view the interior.

To assist in the transmission of heat from the six-cylinder 30-horsepower engine, the cylinders are encircled with copper flanges which increase in the number per cylinder from the front to the back cylinder. From the nature of the metal used and the irregular placing of these flanges, a better and more effective distribution of the air draft forced through by the forward air fan and drawn back by the suction fan in the flywheel is obtained.

The rear axle as used on models *D* and *H* is of the live, floating type, fitted throughout with ball bearings, and is so designed that the load of the rear wheels is not carried on the driving axle, but on an extension of the main tube.

The artillery wood wheels are similar to those of 1906; the size, however, differs for the various models. On Model G 30-inch



FRANKLIN FLOATING REAR AXLE, BEVEL GEAR DRIVEN.

wheels are used, on Model D 34-inch and on Model H 36-inch; all are equipped with tires best suited for service on the different weight cars. Model G having 30 by 3-inch front and 30 by 3 1-2-inch rear; Model D, 34 by 3inch front and 34 by 3 1-2-inch rear; Model H, 36 by 3 1-2-inch front and 36 by 4-inch rear.

The crankshaft is of specially treated nickel steel with an elastic limit of 110,000 pounds and is machined by turning, grinding and lapping, with a limit in diameter and variance between shoulders of .005 inch.

Extreme accuracy is maintained throughout the entire car construction. Cylinders and pistons must be absolute in their measurements, while a variance of .001 on many other parts make them eligible for the scrap pile. The inspection department is equipped with gauges and instruments for the careful inspection of all parts, and for many specially constructed measuring instruments are employed, registering automatically the measurements desired. These are specially made for the Franklin company. In this way variations due to difference in sense of feeling of workmen is overcome. The inspection of all materials and parts is of the most rigid nature. In a fully equipped chemical and physical laboratory all material is thoroughly tested.

A larger and more efficient air fan is being used on Models D and H than was fitted to the 1906 cars. The shape of the blade is such as to throw a larger volume of air with less power than fans heretofore used. All models are also equipped with flywheels of the fan type which draw the air with great force past the engine cylinders.

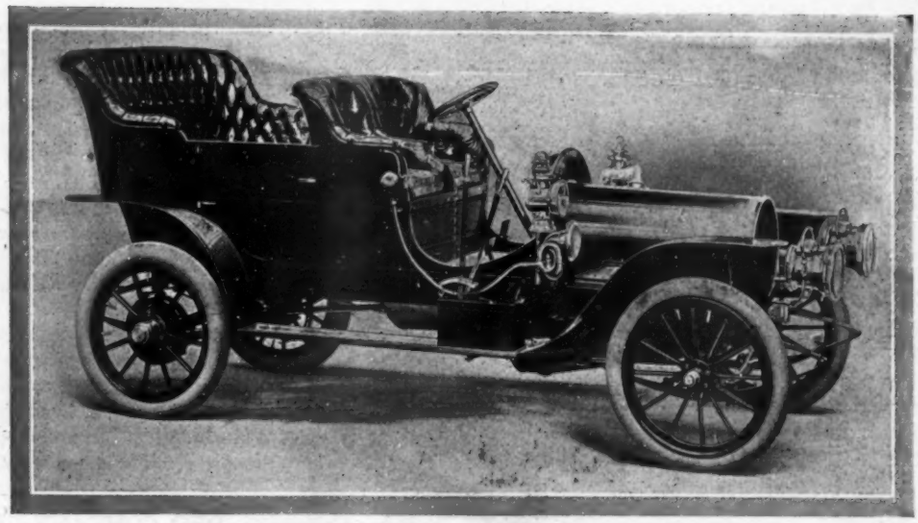
The clutch is of the disk type, of similar construction to that used last season. The disks are of phosphor bronze and steel alternated. The phosphor bronze disks are prevented from rotating in the flywheel by the bolts but are free to move laterally. The steel disks do not touch the flywheel but are carried on the clutch driver, on which they are free to move laterally but can

rotate only with the clutch driver. By means of the universal block the clutch driver is connected directly to the transmission shaft. A flat spiral spring holds the plates firmly against each other when the clutch is engaged or whenever the foot lever is not pressed forward. The ball thrust comes into play only when the clutch is thrown out; then it takes the thrust exerted by pressure upon the foot lever. At all other times it simply revolves as a part of the clutch.

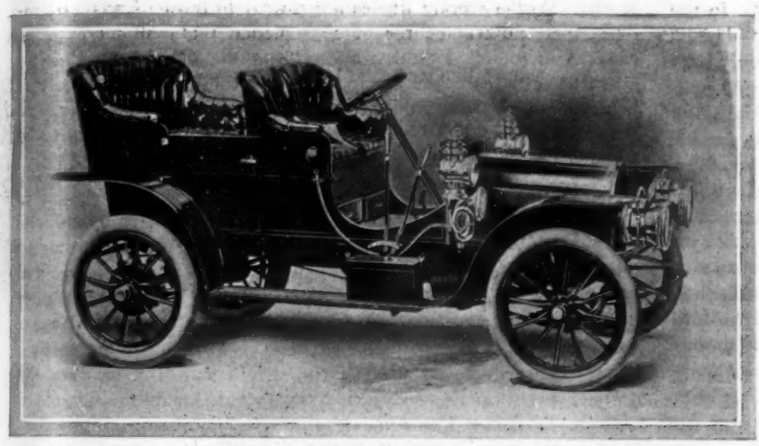
The transmission is contained in an aluminum case placed directly underneath toeboard of the driver's seat. This is so arranged as to be easy of access.

Shafts and gears are made of special 3 1-2 per cent. nickel steel, giving them great strength and wearing qualities. All bearings are made of chrome steel and accurately finished.

Steering yokes on Models D and H are fitted with ball bearings, reducing wear to the minimum and producing a steering device which is very easy of operation and free of lost motion.



FIVE-PASSENGER, 20-HORSEPOWER TOURING CAR, TYPE D.



FRANKLIN 12-HORSEPOWER 4-CYLINDER LIGHT TOURING CAR, TYPE G.

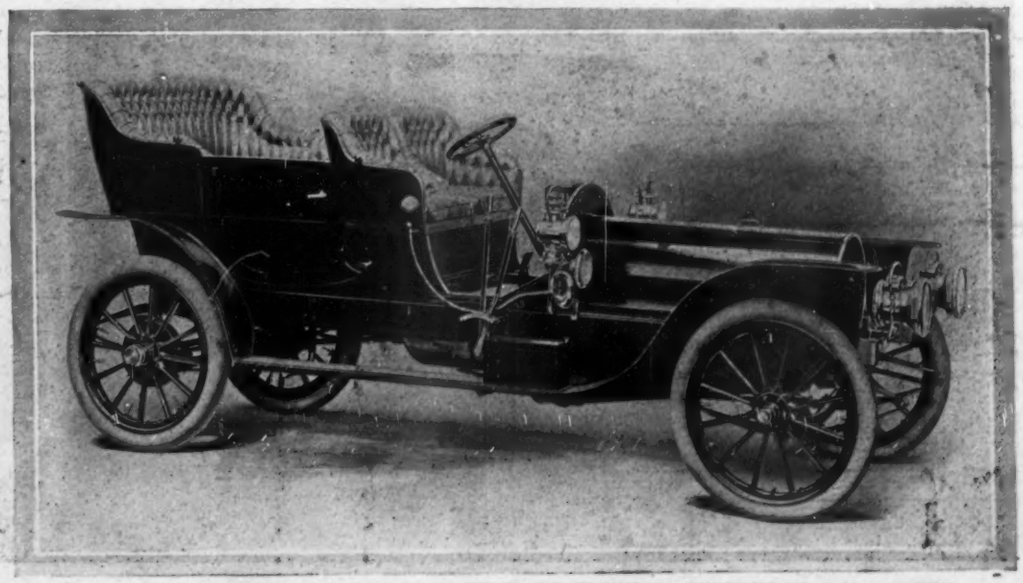
Bevel-driven gear, as well as driving pinion, is made of nickel steel forging. Both of these are hardened and ground to the highest degree of accuracy. The bevel driving pinion is well supported, running in long bearings on each end.

Valves are arranged as heretofore, making it possible to remove them with ease. The auxiliary exhaust gives a very free exit to the burned gases, and the back pressure is reduced, and remaining gases are of much lower temperature. Flame is kept from passing around the regular exhaust valve, because it does not open until the pressure in the cylinder is reduced well down toward atmospheric pressure. Very little carbon deposit gathers in the combustion chamber, the manufacturers state. Instead, it gathers in the auxiliary passages, which may be cleaned in an hour, and should be cleaned about every 1,000 miles. Graphite can be used in the engine base. The timer in construction is of an improved type operated in a manner similar to that used in 1906.

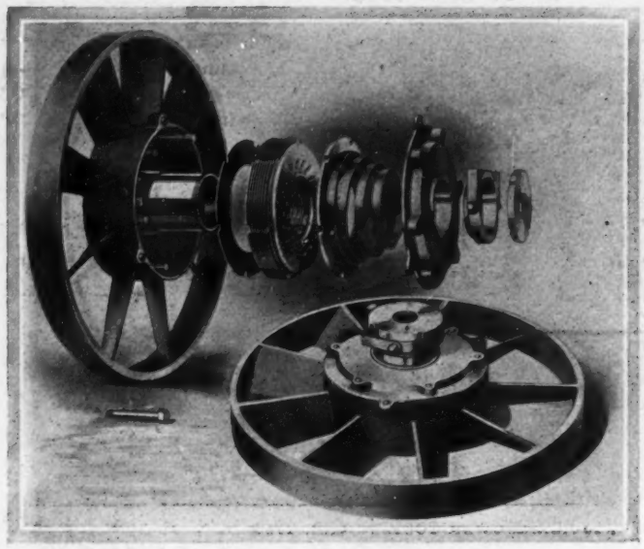
The engine base, transmission and governor are all made from aluminum, and so tightly constructed as to make the entrance of dust and foreign matter impossible.

In general, the 1907 Franklin cars retain the characteristic appearance that has always marked the cars of this make. The all-round ability and reliability of these machines has often been well demonstrated, but the recent transcontinental record-breaking trip of a six-cylinder Franklin has added a strong argument in favor of the air-cooled car of high power.

An interesting report has been made public by the secretary of the State Board of Health of Indiana, J. N. Hurty, in which a compilation of deaths caused by violent means is made for the month of June, the total number being 164. Of these not one was attributable to automobiles, while 4 were due to horses, 25 to railroad accidents and 5 to trolley cars. Statistics of this class but confirm the claims of automobilists that their fatalities are proportionately small.



SIX-CYLINDER, 30-HORSEPOWER, SEVEN PASSENGER TOURING CAR, TYPE H.



FRANKLIN DISK CLUTCH, ASSEMBLED AND DISSEMBLED.

WHITMAN'S RECORD-BREAKING TRIP.

Not content with having made a dash from the Pacific to the Atlantic—four thousand miles, in round numbers—in 15 days, 6 hours, L. L. Whitman will take his six-cylinder 30-horsepower air-cooled Franklin car back over the road to Chicago in an attempt to make a new record for the trip between New York and Chicago. An accident at Conneaut, O., caused a delay which spoiled the carefully laid plans for breaking the Chicago-New York record on the transcontinental trip, and another effort will be made to mar the present mark of 58 hours, 43 minutes, made by a Columbia car.

Whitman started out from San Francisco on August 2 with an ambition to reach New York in ten days, and the schedule was laid out on a ten-day basis. This schedule was adhered to until Wyoming was entered, when heavy rains made the roads muddy and dangerous for fast going, and the original schedule was abandoned. About four days' delay is ascribed to the bad going after entering Wyoming. Up to the time of arrival at Chicago the car had been run only during the day—though some of the days were rather elastic—but there a night and day schedule was laid out. Accompanying Whitman was C. S. Carrus, and the two took turns, one driving the car and the other resting while traveling on train in the same direction, thus keeping the car continually going. Carrus was groping through a heavy fog at midnight near Lake Erie, when he lost sight of the road, and the car went into a ditch, bending the front axle and doing other lesser damage, and slightly injuring Carrus and his mechanic. Repairs caused a delay of 36 hours.

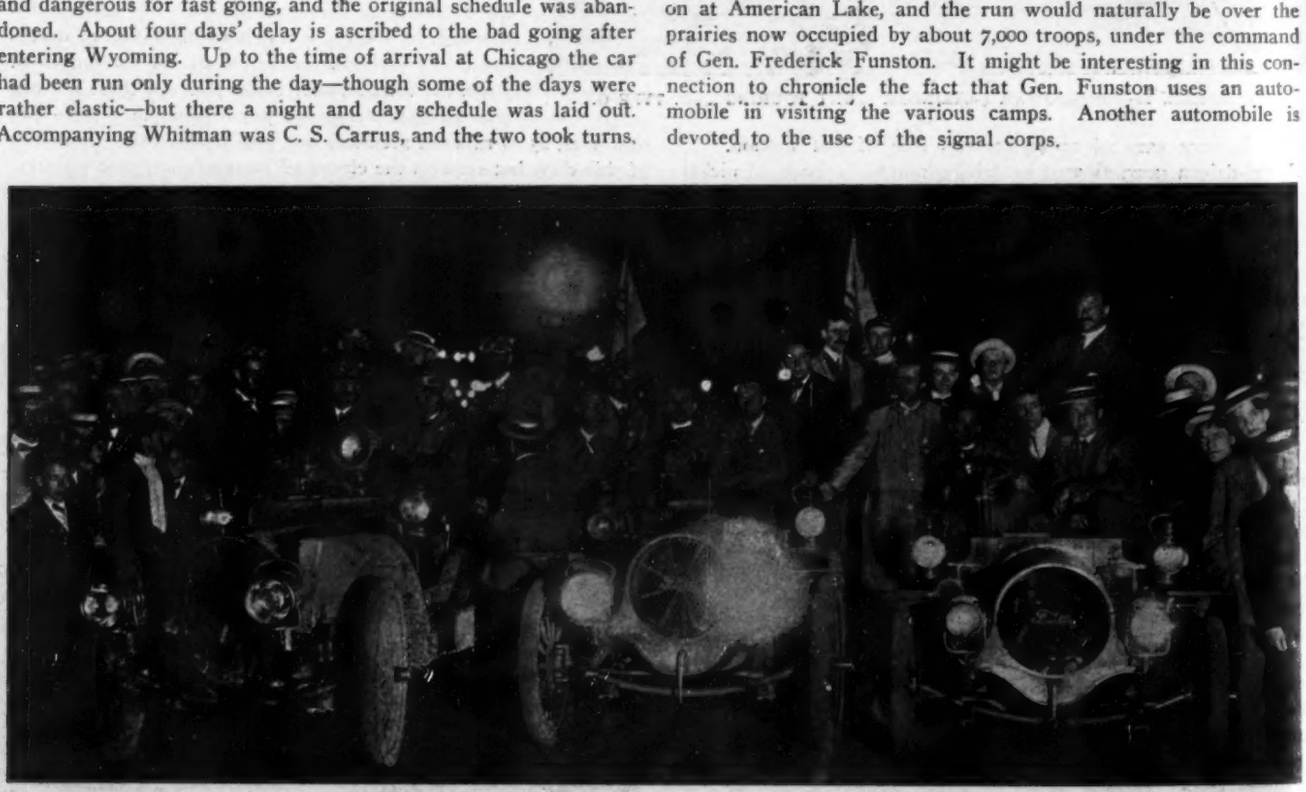
Seventeen days, eighteen hours, were clipped from the best previous San Francisco-New York record, made by the same two men in a little Franklin 10-horsepower runabout two years ago. The record made by the runabout cut in two the best previous time for the ocean-to-ocean automobile trip.

Automobilists turned out in goodly numbers to welcome the tourists at the end of the journey. At Kingsbridge, on the upper extremity of Manhattan Island, where the run ended officially, there were fifteen Franklin cars waiting, full of passengers. Whitman and Carrus were escorted into the city, and a supper at the Astor followed the termination of the remarkable run.

REO COMPANY TO ENLARGE ITS PLANT.

LANSING, MICH., Aug. 20.—The Reo Motor Car Company paid another 10 per cent. dividend on August 15, the third 10 per cent. dividend declared by the company during the present season. The capacity of the plant is now about 120 completed machines per week. This is wholly inadequate to meet the demands and additions are now in course of construction that will increase the capacity of the plant at least one-third. One of the largest orders ever received from one agency calls for the delivery of five carloads of automobiles in August, five carloads in September, and four carloads in October, making a total of 112 machines to be shipped before the first of November.

In the near future Tacoma, Wash., will have an orphans' day. Mrs. W. O. Williams, whose husband is the proprietor of the Reliable Automobile Company, has taken the initiative, and her appeal to other women of the city who have cars at their disposal has borne excellent fruit. Next month is considered a very opportune time, as the Pacific coast encampment is now on at American Lake, and the run would naturally be over the prairies now occupied by about 7,000 troops, under the command of Gen. Frederick Funston. It might be interesting in this connection to chronicle the fact that Gen. Funston uses an automobile in visiting the various camps. Another automobile is devoted to the use of the signal corps.



WHITMAN IN 6-CYLINDER AIR-COOLED FRANKLIN FINISHING OCEAN TO OCEAN DASH AT HERALD SQUARE, NEW YORK CITY.

A NEW G & J TIRE POSTER.

Brief reference was made in THE AUTOMOBILE of July 26 to a colored poster issued by the G & J Tire Company, of Indianapolis, Ind. The accompanying illustration will give an idea of the composition of the picture, though of course the fine effect of the

G & J POSTER—A QUAINT ENGLISH INN.

coloring is lost. Measuring 15 by 20 inches, the picture shows an automobile and a tally-ho coach making a stop in front of a typical old-fashioned English inn, and the contrast between the ancient and modern is strikingly brought out. The scene is true to life, and shows what may be encountered any day in touring England.

A CLEVERLY WORKED SWINDLE.

ALBANY, N. Y., August 20.—For the past few weeks William H. Keeler, proprietor of Keeler's hotel, and an Albany business man well known about the state, has been the almost daily recipient of bills for automobile supplies, largely 34-40 auto-wheels or tires, which the manufacturers and dealers have sold to one Kennedy or Douglass, who represents himself as the chauffeur or mechanician of Mr. Keeler. These bills come from all over the country. Dealers in New York, Boston, Detroit, Buffalo and St. Louis appear to have contributed to the stock in trade of Kennedy and to have taken his assurance that his employer was roving about the country and in constant need of new wheels or other supplies. The bills run from $50 to $131 or more, and the aggregate must now reach a sum over $2,000. The Albany detectives seem to think that they know Kennedy, but if they have communicated with the police of other cities there has been no cessation of the activities of Kennedy or let-up in his demand for supplies for Mr. Keeler's auto.

The humorous part of it to all but the victimized dealers is that ex-Sheriff Keeler never owned an automobile and hardly expects to. It has been ascertained also that Kennedy, where he cannot work Mr. Keeler's name for credit, is filling in blank checks for the amount required for his purchases and signing the name of Wm. H. Keeler. How long this sort of swindle will continue apparently is a matter for some of the dealers who have been victimized and the police to decide.

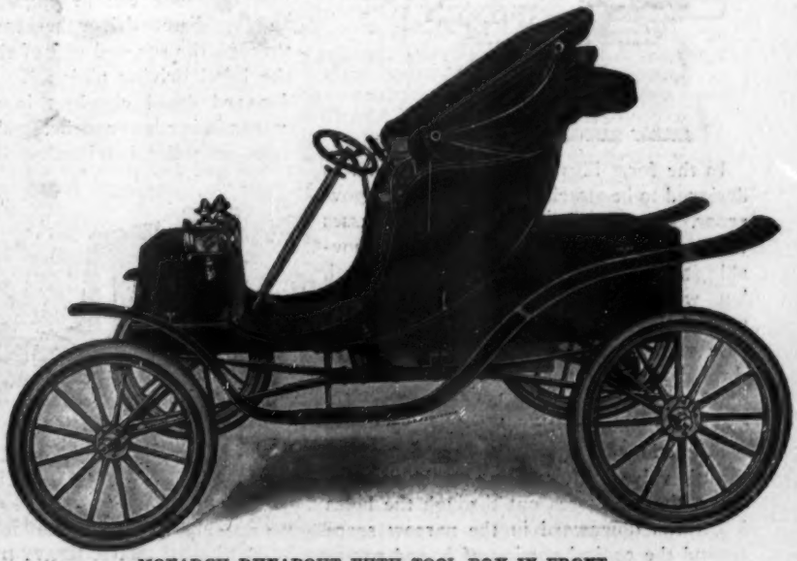
MONARCH 1907 MODELS.

Among the manufacturers whose 1907 cars will be ready for fall delivery is the Monarch Motor Car Company, of Chicago, Ill., builders of the runabout of that name. The Monarch runabout is propelled by a double opposed engine of 4 1-2 inch bore and 4 inch stroke, rated at 12-14 horsepower, driving through a planetary gear and propeller shaft to the live rear axle. The engine is air-cooled. The spring suspension consists of two sets of long side springs, one set of the usual type and the other set inverted and carrying the body. On the lower set is carried the engine in its special frame. The wheels, 28 inches in diameter, are fitted with 2 1-2 inch cushion tires or with 3 inch pneumatic tires, at the option of the purchaser. Steering is by wheel. Lubrication throughout is by means of grease cups except on the cylinders, where oil cups are used for the cylinder oil. This makes the car very clean so far as oil is concerned. Ignition is by jump spark, a double coil being used. There are two sets of brakes, one set being controlled by the single speed-changing lever and the other by a foot pedal; the latter brakes act on drums on the rear hubs. The motor is placed under the footboard where it can be reached without difficulty if necessary.

As the accompanying illustrations show, two new types of bodies have been brought out for the 1907 models, one being a straight dash body and the other a Queen Victoria type with a box in place of the dashboard. The chassis is the same in both cases, having a wheelbase of 78 inches and a 54-inch tread. The weight is something less than one thousand pounds, and the speed is given as from 4 to 25 miles an hour.

One of Philadelphia's prettiest suburbs, Wayne, about twelve miles out on the Main Line and Lancaster pike, will soon boast of an automobile fire engine. The Radnor Fire Company, the bulk of whose membership is made up of wealthy men, many of them automobile owners, decided upon the innovation after a series of meetings. The hilly roads make fast progress to a fire an utter impossibility with horses, and large fire damages have resulted from the delays.

MONARCH 12-H.P. RUNABOUT WITH STRAIGHT DASH.



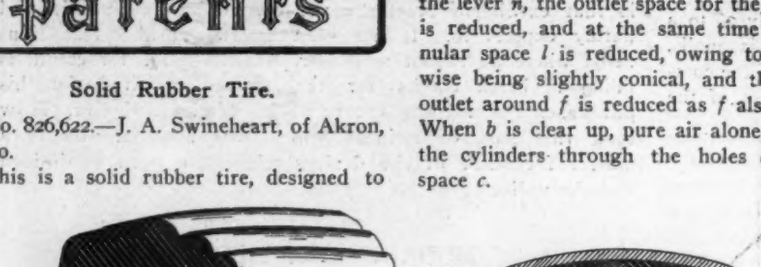
MONARCH RUNABOUT WITH TOOL BOX IN FRONT.

Patents

Solid Rubber Tire.

No. 826,622.—J. A. Swineheart, of Akron, Ohio.

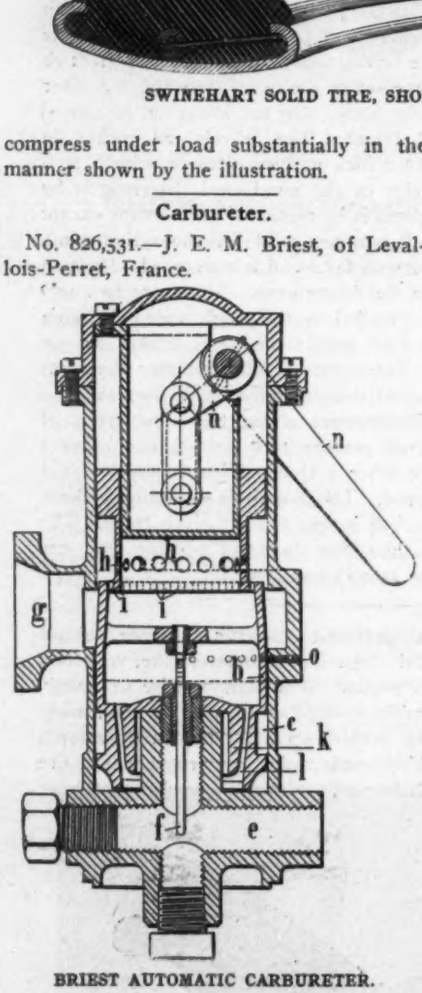
This is a solid rubber tire, designed to compress under load substantially in the manner shown by the illustration.



SWINEHART SOLID TIRE, SHOWING FORM WHEN COMPRESSED.

Carbureter.

No. 826,531.—J. E. M. Briest, of Levallois-Perret, France.



BRIEST AUTOMATIC CARBURETER.

In the form illustrated, this carbureter is designed to be attached to a centrifugal governor. The gasoline enters at *e* and passes upward to the spray nozzle around a movable stem *f*, whose lower end is cylindrical, but which is flattened more and more toward the top. The air enters through the base of the carbureter, and passes upward through the annular space *l* between the fixed member *k* and the lower portion of a movable hollow casting *b*, which combines the functions of a mixture regulator and throttle valve. After taking up the gasoline spray, the air passes out through the holes *h i*, turns downward in the narrow space around the conical portion of *b*, and passes out to the engine at *g*. As *b* is raised by the lever *n*, the outlet space for the mixture is reduced, and at the same time the annular space *l* is reduced, owing to it likewise being slightly conical, and the spray outlet around *f* is reduced as *f* also rises. When *b* is clear up, pure air alone goes to the cylinders through the holes *o o* and space *c*.

Starting Device.

No. 826,903.—C. A. Von Soden-Fraunhofen, of Stuttgart, Germany.

This is a device applied to motors having relief cams acting on the exhaust valves for starting, and it consists in a link and lever connection between the shaft of the starting crank and the camshaft, whereby, when the starting shaft is pushed in to engage with the crankshaft, the camshaft is likewise shifted to bring the starting cams into action.

Transmission Gear.

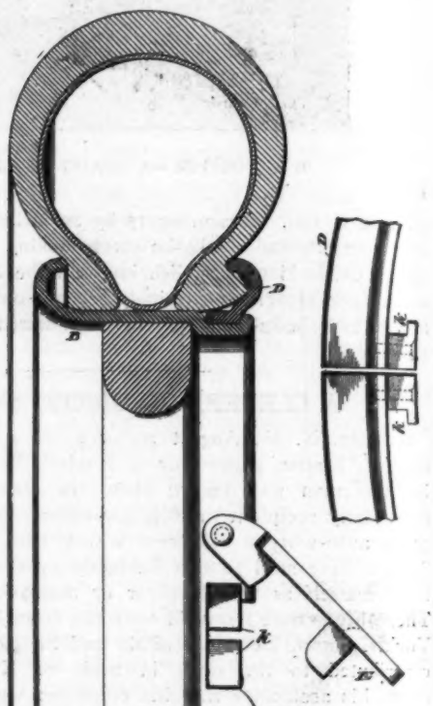
No. 826,793.—A. F. Mack, of Brooklyn, N. Y.

This transmission gear is designed for commercial vehicles, and its object is to permit running the gears in constant mesh without the use of ordinary individual friction clutches. To this end two flywheel clutches are employed, one the ordinary inner clutch *4*, which is used by the direct drive, and the other an outer cone clutch *5*, which is used for the slow forward speed and reverse. The clutches are so separated that only one can be engaged at a time. In the direct drive the transmission is through the squared end of the shaft *6* and the bevel driving pinion *8*. For the slow forward speed clutch *5* is engaged, and transmission is through the sleeve *7*, which runs on roller bearings on shaft *6*, to the pinion *21*, and thence through gear *20*, claw clutch *23*, and pinion and gears *18 19*. For the reverse, the claw clutch engages gear *22*, and the transmission is from *21* through an intermediate gear only slightly visible. This gear is on one shaft with the gear *30*, which transmits motion in the reverse direction to *22*.

Quick Detachable Tire.

No. 826,617.—G. Shugers, of Auburn, Indiana.

This tire is held on the rim by the retaining ring *D*, which is split at one point, and has riveted to it the lugs *k k*, which fit into a notch in the rim *B* and are clamped in place by the piece *E*.

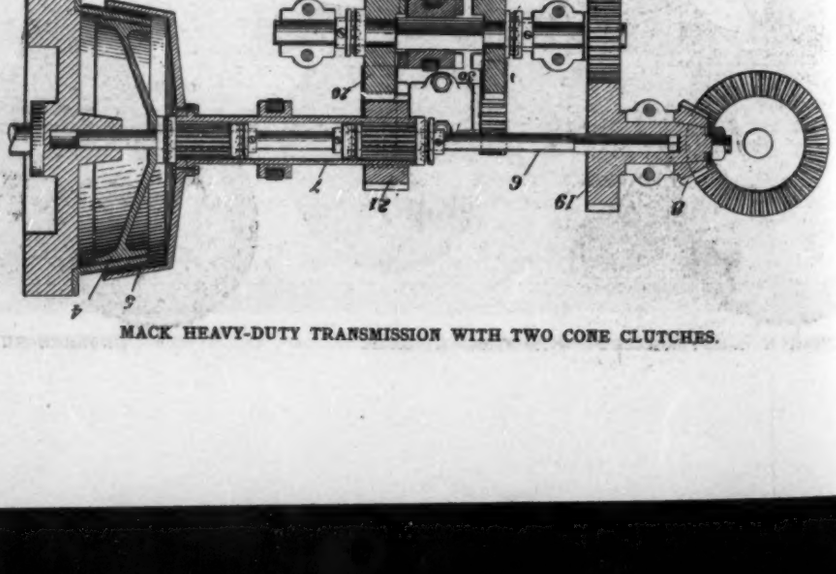


SHUGERS QUICK DETACHABLE TIRE.

Transmission Gearing.

No. 826,365.—C. Schmidt, of Warren, Ohio.

This patent covers the transmission gearing carried in one case with the rear axle in the Packard car.



MACK HEAVY-DUTY TRANSMISSION WITH TWO CONE CLUTCHES.

NEWS AND TRADE MISCELLANY.

According to the statement of H. S. Powell, president and general manager of the Powell Muffler and Timer Company, of Utica, N. Y., that concern will remove to some Western city in the near future.

During a recent stay in San Francisco William R. Hearst was so favorably impressed with the White cars, which are used in great numbers on the Coast, that he purchased one for his own use.

The Autogas Company, of Pennsylvania, a concern which manufactures and markets Autogas acetylene tanks, has established quarters in Philadelphia on Automobile Row—336 North Broad street.

Michelin tires won an enviable record in the recent contest at Ardennes, Belgium. The first five cars to finish were fitted with Michelins—Duray, Hanriot, Rougie, Barillier and Gabriel, who finished in the order named.

A factory has been established at Norwalk, Conn., by the Dikeman Manufacturing Company, for the production of mechanics' tools, screw machine supplies and specialties pertaining to the well-equipped manufacturing plant.

The McLean Auto Company, formerly of 242 West Forty-first street, Eastern representatives of the Lambert friction-drive motor vehicles, are now occupying their new headquarters at 1604-1606 Broadway, where they will be in much better position to exhibit their new line for 1907.

Power has been turned on at the new factory of the Weston-Mott Company at Flint, Mich., and the plant is now in operation, with a force that is being increased daily with additions of employees that are removing from Utica, N. Y., where the Weston-Mott Company has been located for a number of years.

An error appeared in the Diamond Rubber Company's advertisement, published in the August 9th issue of THE AUTOMOBILE. The line reading "A car having much tire trouble could not make," etc., should have read, "A car having much tire trouble could make," etc. The advertisement appears correct in the present issue.

American automobiles are popular in China, and the Columbia car, manufactured by the Electric Vehicle Company, of Hartford, is well represented. Baroness Ward, of Shanghai, purchased a 45-horsepower Columbia at the last show, and took it to China, and Henry O'Shea, of the *China Gazette*, Shanghai, also uses a Columbia. Chinese roads are said to be excellent, and speed laws are as yet unheard of.

A bill of complaint has been filed in the United States Court in Boston by the Boston Auto Gauge Company, of that city, manufacturers of gasoline gauges for use more particularly on automobiles, against the Iver Johnson Sporting Goods Company, also of Boston. The bill charges that the defendant company is selling automobile tank gauges in infringement of patents owned by the plaintiff company, and seeks an injunction and an accounting for damages and profits.

E. L. DeCamp, of Kansas City, Mo., is an enthusiastic autoist who is a believer in the air-cooled motor. In a recent trip with his Aerocar, he drove from Kansas City to Sedalia, a distance of 114 miles over rough hilly roads, with the exception of 35 miles of turnpike, which was in good condition. He carried four passengers, and for the entire trip used only 4 gallons and 3 1-2 quarts of gasoline, or went 23.4 miles per gallon.

A supplementary test on high speed from New York to New Haven and return was made by the 30-horsepower Dorris car August 11. The successful run to Boston and return the earlier part of that week was a very satisfactory performance, and the additional test was made to further prove running abilities. The tests were conducted by E. B. Jackson, of the Barnett-Jackson Company, Fifty-fourth street, near Broadway, eastern agents of the Dorris Motor Car Company, of St. Louis.

It is said that the first automobile trip ever driven between Rochester and Buffalo in an electric car was recently made by C. P. Smith, of the Genesee Motor Vehicle Company, of Rochester. The trip from Rochester to Batavia, thirty-nine miles, was made in 2 hours 30 minutes. After finishing a demonstration in Batavia and another in LeRoy, the journey to Buffalo was renewed, and the 40 miles was accomplished in 2 hours 17 minutes. Owing to the high speed maintained, it was necessary to recharge the batteries in Batavia. The entire trip, including demonstrations, was 110 miles.

With a capitalization of $75,000 the Annable Pneumatic Spring Company has been formed to handle the pneumatic spring for automobiles which W. W. Annable, of Grand Rapids, Mich., perfected some time ago. Patents on the device are at present pending. The company consists largely of Detroit capitalists, and the headquarters will probably be located in that city. The officers are: Strathearn Hendrie, president; W. W. Annable, vice-president; Berthune Duffield, secretary-treasurer. By the use of the spring it is claimed automobiles can be run upon solid tires, as the spring absorbs all the shock.

NEW AGENCIES ESTABLISHED.

The Keystone Motor Car Company has succeeded the Pennsylvania Electric Vehicle Company as the Philadelphia representative of the Buick car. H. E. Shiland, of the Buick Motor Company, last week completed the details. The Keystone concern also handles the Autocar and Packard.

A change in the New York agency of the Stoddard Dayton will take place September 1, at which time A. H. Whiting will assume charge and will open headquarters at 1655 Broadway. The Stoddard Dayton line for next year will include a 16-horsepower runabout at $1,500, a 30 to 35 horsepower touring car at $2,500, and a $3,500 limousine, all the four-cylinder type.

In the issue of THE AUTOMOBILE, August 9, it was erroneously stated that the Franklin agency for St. Louis had been taken by the Cadillac Automobile Company. The item should have read that the Franklin agency in Kansas City, Mo., had been secured by the Cadillac Automobile Company. The representative of the Franklin in St. Louis is the Halsey Automobile Company, which has handled Franklin cars since 1902.

The Corbin Motor Vehicle Corporation, of New Britain, Conn., have taken over the New York agency of the E. T. Kimball Co., including the store lease, office fixtures, etc., at 1779 Broadway. Lafayette Markle, who has been connected with the Kimball Company for some years, will be the New York manager. This plan of the Corbin company, in marketing their goods direct through a branch in the metropolis, is one that is followed by many leading manufacturers who have New York connections. Mr. Kimball will, however, retain the Boston agency for the Corbin car, having established the same last spring in one of the most prominent stores in the new Motor Mart in that city.

PERSONAL TRADE MENTION.

A. H. Whiting, formerly sales manager of the Autocar Company, will be New York representative for the Stoddard-Dayton car, succeeding the Zim-Rock Company.

E. A. Robertson, sales manager of the Hartford Suspension Company for some time, has been promoted to the general managership by President E. V. Hartford.

H. C. Teel has resigned his position as superintendent of the Olds Gas Power Company, of Lansing, Mich., to accept the position of assistant superintendent of the Reo Motor Car Company.

Richard Schmitz, one of the pioneer gas engine builders of the country, has resigned his position as superintendent of the Continental Motor Manufacturing Company to accept a similar position with the Silent Knight Company, of Chicago.

J. O. McDonald, for several years identified with the trade in Ohio, and F. S. Titus, for five years with the Marion Automobile Company, of Marion, O., have formed a partnership under the name of McDonald & Titus, at 138-140 Spring street, Columbus, O., and taken the agency for the Reo for that locality.

John C. Speirs, who recently accepted the position of superintendent of the Wayne Automobile Company of Detroit, has returned to New England, having accepted the position of factory manager of the Corbin Motor Vehicle Company, of New Britain, Conn. The Corbin Company's desire to secure Mr. Speirs, who is noted as a first-class producer, and his own inclination to work in New England, the scene of his early business success, are responsible for the change.

L. J. Sackett has accepted the position of General Sales Manager of the Moon Motor Car Co., St. Louis, and has already entered upon the duties of the position. Mr. Sackett is one of the most widely known automobile salesmen in the country, and has been connected with the industry since its earliest inception, having filled responsible positions with the Waltham Manufacturing Company, the Locomobile Company, and the Peerless Motor Car Company. His hosts of friends will wish him success in his new position.

A. F. Camacho, formerly manager of the American Automobile Storage Co., of New York, and more recently in charge of the Gaither-Owen Carbureter Co., has become connected with the National Sales Corporation, of New York. Mr. Camacho will assume the position as assistant manager, and will look after the technical details in connection with the National Sales Corporation's business. The Gaither-Owen Carbureter will be sold through the National Sales Corporation hereafter, and Mr. Camacho will devote his special attention to that appliance.

INFORMATION FOR BUYERS.

ELECTRIC LAMP HOLDER.—Every automobilist, mechanic or repair man who has had to work by electric light knows how troublesome it is to have a fixed light. Shadows are sure to fall on just that part of the job that must be worked on. An adjustable lamp holder designed to overcome this difficulty has been placed on the market by the Wells Light Manufacturing Company, of 44-46 Washington street, New York. The device is shown in the accompanying illustration, and consists of a wall bracket, two arms with universal joints, and the lamp socket and wire lamp guard. With this combination the lamp can be swung into any position within the range of the length of the arms, and can be quickly moved to shine on the work to the best advantage. The device is known as Wallwork's Universal Electric Lamp Bracket, and is described in an illustrated booklet issued by the manufacturers.

WALWORK'S JOINTED LAMP BRACKET.

BRASS AUTOMOBILE SPECIALTIES. — Brass automobile trimmings are the specialty of the H. D. Taylor Company, of 101-105 Oak street, Buffalo, N. Y., a concern having very extensive facilities for manufacturing and well known in other lines of business. Among the articles manufactured are the Brewster curtain fasteners, for automobile side curtains, brass bow rests, brass mouldings, all highly polished. A full line of automobile trimmings is carried, including leather, rubber, pantasote, fabrikoid, fancy cloths, transparent sheets, upholstering hair, and so on. The company is prepared to manufacture anything in brass, and will be glad to make quotations on receipt of samples or patterns.

MARION AIR-COOLED CAR.—An interesting little catalogue describing and illustrating the Marion air-cooled car is issued by the Marion Motor Car Company, of Indianapolis, Ind. Many of the principal details are illustrated, giving an excellent idea of the general construction of the machine. The Marion has a four-cylinder vertical air-cooled motor, rated at 24-28 horsepower, placed in front under the hood and driving through a multiple disk clutch, three-speed sliding gear transmission and bevel gears to the countershaft; final drive is by side chains to sprockets on the rear wheels. An interesting feature is that the clutch, change-speed gears and the bevel gears are all contained in a single sub-divided casing, so that all are rigidly held in alignment. The engine crankshaft has five journals of sufficient area to give a large wearing surface, and is made from high carbon steel. Special attention has been given to making the car ride comfortably; the front springs are full elliptics 36 inches long, and the rear springs are double scrolls, 38 inches long; all springs are 1 3-4 inches wide and are oil tempered. Auxiliary buffer leaves are fitted to take the shocks of abnormally violent compressions due to very rough roads. Lubrication of the engine is accomplished by a special form of splash. Under each cylinder in the bottom of the crankcase, is a compartment containing one quart of oil. This is just the right quantity to lubricate the engie properly when the splashers on the lower ends of the connecting rods throw the oil up. These splashers are thin blades, so that only the right quantity of oil is thrown up, and the makers state that there is never sufficient oil carried up to cause a blue smoke in the exhaust. The one gallon of oil contained in the case is said to be sufficient for from 150 to 200 miles running.

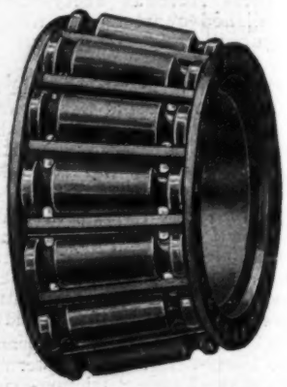
REMOVABLE LAMP NUMBERS.—Lamp numbers are frequently painted on the lenses of the lamps of the car, and can only be removed by scraping them off. In touring it is sometimes necessary to change numbers in going from one State into another, and the painted number is then a nuisance. To avoid such annoyances removable lamp numbers have been designed and placed on the market by Horace E. Fine, of 19 East State street, Trenton, N. J. These numbers are stenciled in aluminum plates, and each number plate has a phosphor bronze wire spring retainer to hold it in position inside the lens of the lamp. The springs are easily adjusted to fit any lamp, and the number can be put in with the thumb and finger, and instantly detached at any time for the purpose of changing numbers or for cleaning the lamp. Numbers are made one inch high and two inches high, some States requiring larger numbers than others. This concern also makes number pads of leather, stiffened by a metal plate, and of aluminum with numbers embossed and enameled, of the sizes prescribed by the laws of various States. A number of styles of type are available to choose from, and pads can be made reversible, having a number on each side—a useful arrangement for a car that is often driven in two adjoining States.

METAL POLISH.—Metal polish in a convenient form has been placed on the market by the Bott Brothers Manufacturing Company, of Columbus, O. This polish is packed in cans in the form of powder, and for us is mixed with gasoline; one pound of powder is sufficient to make a gallon of the polish. No grease, acid or poisonous substances are used, and the makers state that there is nothing to injure the hands. A brilliant and lasting polish is the result of its use, they state. The powder is known as Nay's polishing compound.

AUTOMOBILE INSURANCE.—Insurance policies covering loss, damage or liability due to automobile fires, explosions, lightning, theft, collision or claims for damages are written by Farjeon, Bagot & Co., brokers, of 42 Broadway, New York. Policies are issued protecting the car while in the garage, on the road in use, or while being transported by train or by boat. A pamphlet issued by the company gives much information regarding these policies.

BIG CATALOGUE.—An unusually large and complete illustrated catalogue of automobile accessories, imported and domestic, has been issued by the Dac Automobile Supply House, Broadway and Fifty-sixth street, New York. Wholesale and retail trade is supplied. In addition to all kinds of accessories, clothing, instruments, tires, tools and so on, this catalogue lists a variety of screws, bolts, nuts, ball bearings and forgings, finished and unfinished. Crankshafts are included in the last class, and are furnished in various sizes, rough or machined.

TIMKEN ROLLER BEARINGS. — The large catalogue issued by the Timken Roller Bearing Axle Company, of Canton, O., describes an extensive line of roller bearings for automobile use, roller bearing front axles with steering pivots of the Elliott, reversed Elliott or Lemoine types, roller bearing rear axles of the stationary type for side chain drive and of the live type for bevel gear or center chain drive, front and



TIMKEN ROLLERS AND RACE.

rear axle for heavy truck work, the Hedgeland anti-skid solid rear axle, and other automobile parts, including a brake of the internal expanding type. The accompanying illustrations show the construction of the Timken bearing, one showing the rollers in their cage in place on the inner race, and the other the race separately. The bearings are made with conical rollers rolling on a conical race, the tapers being so calculated that the rollers do not slip at any part of their length. The ribs, two in number, on the race, enter correspondig grooves in the rollers, and not only keep the rollers in position, but take side thrust. The motion of the grooves on the ribs is a pure rolling one, there being no slip whether side thrust is being taken or not. The cage is merely a floating affair and is subjected to no stress, and the same is true of the little nibs on the ends of the rollers that enter the holes in the cage plates. The cup, or outer race, is a plain cone fitting over the rollers, and is not ribbed. These bearings are made in a great many different sizes and capacities, and are adapted to a very wide range of duty. Among the applications described in the Timken catalogue is an electric motor, and the manufacturers state that their bearings are especially adapted to this class of service. Timken bearings are easily adjustable for wear.

INNER RACE, SHOWING RIBS.